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Legend of the Ztarr

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Skepticism in Popular Culture

'Sciencey' Amateur Paranormal Investigation

Doomsday & Antimatter Pseudoscience

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Getting People Emotionally Invested

We science-minded skeptics are very good at amassing facts and evidence to counter questionable claims. It is what we do best. Some such skeptics are then also very good at communicating those fact-based assessments to broader audiences. But as I and others have written many times in recent issues, our minds are resistant to information—even highly reliable information—that contradicts our beliefs. To get through that innate resistance, other forms of communication that connect directly to our emotions are far more effective. Art, music, and stories move us in ways that intellectual arguments never can, and the more popular forms of these are often best.

Sara E. Mayhew knows all of this, and in our cover article (with her cover art) she delves deeper into those issues and provides vivid examples of how entertainment, including books, television, film, music, and graphic novels, can be a powerful way to convey a message. As she says, intellectual arguments can be far superior to those made in belief-based schools of thought, but adding a good emotional argument may help promote science-based thinking by getting people emotionally invested in the idea.

She has done this with her own work as a writer and illustrator of manga graphic novels; in her latest work, lead character Adora Ztarr uses her skeptical mindset and critical thinking abilities to solve problems. The Harry Potter books and movies also use the fantasy genre—not to promote fantasy but to tell powerful, meaningful stories that end up promoting critical thinking. The characters are taught to think for themselves and examine their own assumptions and biases. Harry's friend Hermione is the consummate problem solver, extolling logic and reason to break through new barriers. As Mayhew illustrates, the power of storytelling can be harnessed to help people avoid self-deception and become empowered with the tools of critical inquiry.

Sharon Hill then describes her study of 1,000 amateur research and investigation groups. These are groups, ubiquitous now on cable television and present in every state of the union, that feature individuals or teams of nonscientists to "investigate" alleged paranormal phenomena—ghosts, monsters, and other spooky activities. She finds these groups not scientific but "sciencey"—they use technology and the jargon of science to portray themselves as scientific without ever really employing any truly scientific methods. It is a kind of sham science, but it sure is popular.

Since our first two contributors are women I want to recommend a valuable new forum. Julia Lavarnway, our managing editor, has begun a lively blog promoting female voices in the skeptical movement. It is called *We Are SkeptiXX*. The first installments are online now (weareskeptixx.wordpress.com).

I guess *Star Trek*'s antimatter engines aren't going to be the power source of choice for any future space travel. John Eades, who as a CERN senior physicist did research on antihydrogen and antiprotonic helium, provides an informative examination of antimatter. He runs the numbers and shows us why creating antimatter (specifically antiprotons) and harnessing it in quantities anywhere near those necessary to provide useful energy brings, as he says, "an entirely new dimension to the idea of doing things the hard way." He also annihilates a number of other recently popular ideas that in effect are "antimatter pseudoscience."

—Kendrick Frazier

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American Bigfoot Researcher Decries Russian Yeti 'Stunt'

Sharon Hill

Jeff Meldrum, anthropologist and professor of anatomy at Idaho State University, spoke out about his recent excursion to Siberia to examine the existence of the Russian Yeti (see "Russians Confirm Evidence of Yeti—But For How Long?" SI, January/February 2012). Meldrum was a featured speaker at the Pennsylvania Bigfoot Conference in Youngwood, Pennsylvania, on October 23, 2011, where he gave his impressions of the trip. Meldrum told the audience that the Yeti "evidence" presented was poor and the event looked more like a staged publicity event to promote tourism to the Kemerovo region. His presentation, "The Russian Connection," was not his original topic; he wrote the talk upon advice from the conference organizers after the media storm that ensued regarding the announcement that "scientists were 95 percent convinced" that the Russian Yeti exists.

Along with American scientist John Bindernagle and researcher Ron Morehead, Meldrum was part of the team invited to the Kemerovo region of Siberia to discuss the formation of a scientific commission to study the Yeti. Led to believe there was significant scientific interest from the academic institutions in the area, Meldrum expressed his dismay when the press coverage was greater than the public and academic interactions.

Meldrum described how the local Russian contingent greeted and treated the invitees with much pomp and ceremony but little scientific protocol. The attendees were taken on a field trip to a not-so-remote cave in the municipality of Tashtagol where Meldrum said he became concerned when twisted and broken trees were too conveniently located near their paths. He noticed cuts in the trees that the guides indicated as marks of the Yeti. Informed that the cave was a probable Yeti habitation, the researchers were excitedly shown newly discovered footprints (only right foot impressions) and a "nest" that appeared unused. Meldrum was less than impressed with the evidence, which seemed to appear "right on cue" and also included a clump of hair taken from one print. No hair or samples were taken from the supposed nest. In a photo opportunity, Igor Burtsev, director of the International Centre of Hominology in Tashtagol, jumped into the nest, completely ruining it as "evidence." Burtsev holds the belief that Yetis in the area are a Neanderthal relic population, and he espouses the idea that Bigfoot-like creatures have paranormal abilities to exist undetected.

Jeff Meldrum, professor of anatomy and anthropologist at Idaho State University, with a cast of a supposed Bigfoot print.

After the field trip, the local professors, including Burtsev, pressed the researchers to sign a consensus statement saying that what they saw constituted evidence that the Yeti exists in the region. Meldrum revealed that Valentin Sapunov, a literature professor from St. Petersburg, was the one who drafted the "95 percent certain" language. Meldrum refused to sign, noting that "science doesn't work by committee." Yet the "95 percent" statement was delivered to press outlets and became news all over the world.

While trying to stay positive about the potential existence of large unknown hominids (and diplomatic toward his foreign hosts), Meldrum expressed to the Pennsylvania audience that he felt the Russian conference was "orchestrated" with "publicity stunts" to promote tourism for the region. He projected an annoyed tone when discussing parts of the trip and the interactions with non-scientists, and ultimately was dismayed that the Russian group "exploited his credibility." Meldrum made it clear that he prefers the study of hominids to be left to people with qualifications and training and not to purveyors of the paranormal and exploiters of tales without evidence.

An expanded version of this report, available at http://wp.me/p21oZP-zl, includes comments by Igor Burtsev calling Meldrum a "debunker" and "haughty academician feigning a Bigfoot researcher."

Sharon Hill researches issues regarding science and the public and is the owner of the *Doubtful News* website.

Yeti Finger Mystery Solved

After languishing in a London collection for half a century, a tantalizing piece of evidence for the existence of the Yeti (formerly known as the Abominable Snowman) has finally been scientifically examined.

A finger long claimed to be from a Yeti, once held in a monastery in Nepal, was examined by researchers at the Edinburgh Zoo to determine if the digit was really from an unknown bipedal manlike creature. The finger, which was either bought or stolen from the Pangboche Buddhist monastery (depending on which version of the disputed story you believe), has been in the collection of the Royal College of Surgeons in London, England. It was taken from the monastery by Bigfoot researcher Peter Byrne and, so the story goes, smuggled out of the country by beloved Hollywood actor Jimmy Stewart, who hid the monstrous finger amid his wife's lingerie. The finger has generated controversy among Bigfoot and Yeti believers for decades. Up until recently it was impossible to know for certain what kind of animal finger it was.

Photo: BBC

If it is indeed a Yeti finger, as is widely claimed, then the mysterious beast is even more manlike than anyone imagined. Yes, the Yeti finger is human, perhaps taken from a monk's corpse. Rob Ogden of the Royal Zoological Society of Scotland explained to BBC News, "We had to stitch it together. We had several fragments that we put into one big sequence and then we matched that against the database and we found human DNA."

The famous Yeti finger has been debunked by modern science—just as previous Yeti evidence has been over the years. In 1960 Sir Edmund Hillary, the first man to scale Mount Everest, found what he claimed was a scalp from the beast during his search for evidence of the Yeti. Scientists later determined that the "scalp" was in fact made from a serow, a Himalayan animal similar to a goat. Every single piece of promised Yeti evidence discovered has yielded exactly nothing, yet the search will certainly go on.

— Benjamin Radford

Yes, But Who Wrote Einstein?

Right on the heels of SI's much-discussed cover article "Did Shakespeare Write 'Shakespeare'? (November/December 2011) by Joe Nickell, the November 21 *New Yorker* published a delicious satirical column, "Who Wrote Shakespeare?" (p. 65), sticking it to Shakespeare deniers. The brief article is bylined "Eric Idle, . . . Most likely Michael Palin, really."

Idle (or Palin?) proposes who actually wrote a whole bunch of other great works of literature. (Two examples: "Simone de Beauvoir wrote all of Balzac and a good deal of *Les Miserables*, despite the fact she was not yet born when she did so." Napoleon wrote *A Tale of Two Cities* "while visiting St. Helena.")

His final two paragraphs skewer believers in intelligent design, flat-Earthers, and the church's attacks on Galileo. Darwin was written by Jack the Ripper, "who was probably King Edward VII, since all evidence concerning this has been destroyed."

"Paranoia? Of course not. It's alternative scholarship. What's wrong with teaching alternative theories in our schools. . .? What gives teachers the right to say what things are? Citing 'evidence' is so snobbish and elitist."

The piece is only two columns long but makes the point(s) with telling power. *—Kendrick Fraizer*

Krauss Named Honorary CFI Board Member

Physicist and author Lawrence Krauss has accepted an invitation from the Center for Inquiry board of directors to serve as an honorary board member. Krauss will serve as a nonvoting member.

A highly regarded international leader in cosmology and astrophysics, Krauss is the author of more than three hundred scientific papers, a member of numerous professional societies, and a recipient of many international awards. He has been particularly active on issues of science and public policy, leading the effort by scientists to defend the teaching of science in public schools.

Krauss holds several positions at Arizona State University. He is foundation professor in the School of Earth and Space Exploration and Physics Department and director of the Origins Project, which explores questions regarding the origins of the universe, human culture, and cognition.

He is author of nine popular books, including the international best seller *The Physics of Star Trek* (2007); the award-winning *Atom: A Single Oxygen Atom's Journey from the Big Bang to Life on Earth . . . and Beyond* (2002); *Quantum Man: Richard Feynman's Life in Science* (W.W. Norton & Company, 2011), named Book of the Year for 2011 by *Physics World*; and most recently *A Universe from Nothing: Why There Is Something Rather Than Nothing* (Free Press, 2012).

Krauss is also a Committee for Skeptical Inquiry fellow.

Literary, Secular Communities Mourn Death of Christopher Hitchens

The death of author and critic Christopher Hitchens was mourned by the literary world and secularists everywhere. Hitchens died in Houston on December 15, 2011, at the age of sixty-two after a long and public battle with esophageal cancer. He wrote frequently about his disease in *Vanity Fair*, where he was a prominent contributor.

Hitchens was also a long-time columnist for our sister magazine, *Free Inquiry*, published by the Council for Secular Humanism.

Some called him the greatest essayist of our time.

"Christopher Hitchens was a gifted writer and polemicist, with razor-sharp wit and an acute intellect, who was also a steadfast champion for secularism," said Ronald A. Lindsay, president and CEO of the Center for Inquiry (CFI). "We are deeply saddened by his death."

Hitchens's book *God Is Not Great* contributed to a rising national and international debate about religion and helped bring newfound respectability to rationalists and nonbelievers worldwide.

CFI released the following statement on the day of his death:

> Hitchens left us many words of wisdom. But perhaps one quote stands out. In *God Is Not Great*, Hitchens wrote, "Human decency is not derived from religion. It precedes it." In this concise, insightful observation, Hitchens captures all that needs to be said about the independence of morality from religion.
>
> Hitchens has left humanists and atheists a rich legacy of logic, fearless advocacy, and wit. It's up to us to make good use of it.

Hitchens's book *God Is Not Great* contributed to a rising national and international debate about religion and helped bring newfound respectability to rationalists and nonbelievers worldwide.

CSICon New Orleans 2011

Our New Science-Oriented SkepticFest

The Committee for Skeptical Inquiry held its CSICon New Orleans 2011 conference October 27–30 at the New Orleans Marriott. It was a welcome resumption, after an eight-year hiatus, of CSICOP conferences.

It featured a dozen symposia on everything from conspiracy theories and UFOs to evolution versus creationism and skepticism in the media; special talks by skeptical luminaries; an awards banquet; and a host of social and entertainment events. The latter included a "Smarti Gras" parade and New Orleans Halloween Party Saturday evening at a French Quarter bar after the special conference address by Bill Nye "The Science Guy." Here we offer several reports and a photo gallery.

Ideas and Analysis, Frauds and Fun: An Intellectual Treat

KENDRICK FRAZIER

Like its earlier CSICOP conference predecessors, CSICon New Orleans 2011 was rich with provocative ideas, good science, critical thinking, informed analysis, and penetrating criticism of claims poorly supported by scientific evidence. It was also filled with fun social events that allowed plenty of opportunity for interactions with fellow skeptics and to enjoy the camaraderie shared by those who defend good science and expose shams, frauds, and unsupported claims.

It began on a Thursday afternoon with opening remarks by Center for Inquiry President Ronald A. Lindsay, CSI Executive Director Barry Karr, and me, and ended on Sunday afternoon with a "Houdini Séance" conducted by Joe Nickell, Ray Hyman, and Massimo Polidoro. The sessions provided quite an intellectual feast for science-minded skeptics of every stripe.

Some of the many highlights for me included:

• Bill Nye "The Science Guy's" special conference address, informative and inspiring. He provided a cosmic perspective on human curiosity and exploration and a sterling defense of the need for good science and math education for a science-literate citizenry. He ended with a backlit photo from the Cassini mission of a close-up Saturn seen from outside its orbit inward, the planet Earth a tiny dot barely visible through its rings.

• Chemistry Nobel laureate (and CSI Fellow) Sir Harry Kroto's talk "Education as the New Dark Age Approaches." It excoriated parents who allow their religions to teach hatred toward others religions, lamented the rise of ideological-oriented nonsense (rather than common sense), and extolled natural philosophy ("the only philosophy we have devised to determine the truth with any degree of reality"). Kroto also called for more recognition of "true heroes" (those from the world of science, like Einstein, Darwin, Chandrasekhar, Maxwell, and Rosalind Franklin) and emphasized the importance of learning algebra and calculus ("the universe doesn't speak any other language").

• Chris Mooney's talk (in a session on science and public policy) on the science of denial. He emphasized (as we have reported several other times recently) that corrections don't change people's false beliefs; in fact, they cause people to hold them all the more strongly, "doubling down" on them. Studies of "motivated reasoning," the updated view of cognitive dissonance, show that we are not conscious of the vast majority of what our brains are doing and that our emotional reactions drive our memory retrieval. "By the time we are conscious of it we are defending ourselves—acting like lawyers. . . . This is how people work. We spin out all of the old rationalizations . . . and create new ones." And then there's what he called the "smart idiot" effect, in

photos: Brian D. Engler

Lawrence Krauss delivers a special luncheon address; Sandra Blakeslee talks about skepticism in the media; Phil Plait is dubious of *Armageddon*'s presentation of asteroids; Eugenie C. Scott addresses the banquet crowd before presenting Bill Nye with CSI's In Praise of Reason Award.

"It is error only, and not truth, that shrinks from inquiry."
– Thomas Paine

3 FOR TOMORROW

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which people who know more are more capable of showing bias and more skilled at coming up with arguments to defend their biased views. Thus things always polarize, a situation we now find endemic in political discourse.

• Indre Viskontas (neuroscientist and TV's *Miracle Detectives* scientist; see the interview with her in our November/December 2011 issue) on why we love stories and on using narratives to promote science. Why stories? Because we find them compelling. Stories or testimonials usually trump dry statistics because they are more easily remembered than facts. Likewise, stories become personal. Storytelling thus is a powerful tool for any message, including that of science and skepticism. In her role on the show, Viskontas says, "My job is to reframe the [claimed miracle] event in a way compatible with science. Some people might call me a skeptic."

• Biologist and famed blogger PZ Myers's passionate paean to the power of narrative storytelling (in stated strong agreement with Viskontas). Myers's Myth Number One is that we "people of reason" are "soulless robots who don't know how to communicate." He rattled off a long list of scientist-atheists who are first-rate scientists and communicators. "This is a golden age of science writing," he said. His Myth Number Two: "If you are credible or gullible you are so much better at stories." The Bible, often extolled by even skeptics as at least full of good stories, got no praise from Myers. "Genesis is crap. It's crazy town.... There was no global flood. This story makes no sense." As for those who give it a pass by saying that Genesis is just a metaphor, he said, "Tell that to the people at Answers in Genesis." Said Myers, "Our side has the good story," and it has both truth and beauty, two values often ignored. He provided a sample story, a fossil find showing a mammoth bone carefully (and lovingly?) placed in the mouth of a fossil dog, "the best present you could give a dog" and a strong clue that "dogs have been our partners for thousands of years." Another compelling story is that around 50,000 to 70,000 years ago a catastrophe of some sort reduced the entire world's population to only about 1,200 people, including only about 500 in Africa. "We were close to extinction.... *This* is the story that science can tell you. It is underappreciated." As he said, "Our stories are not only beautiful, they are true."

Stories or testimonials usually trump dry statistics because they are more easily remembered than facts. Likewise, stories become personal. Storytelling thus is a powerful tool for any message, including that of science and skepticism.

• Investigator Massimo Polidoro's "A Recipe for Testing Psychics" and his five rules: 1. Exactly define a claim (in writing). 2. Agree on a shared protocol. 3. Have the psychic perform a demonstration (which should be 100 percent successful, since there are no controls). 4. Add the control. 5. See what happens

photos: Brian D. Engler

The X-Files's William B. Davis presents on skepticism in the media; CSI's Barry Karr gives welcoming remarks; Margaret Downey and CFI–DC Executive Director Melody Hensley are all smiles at CSICon; Paul Offit talks about the importance of vaccination during a special luncheon address.

photo: Adam Issak

photo: Adam Issak

photo: Brian D. Engler

photo: Brian D. Engler

. . . "and wait for the excuses." In his twenty years experience, "only once has a person admitted [they were] wrong."

• Physician Paul Offit's stirring advocacy of vaccinations and condemnation of anti-vaccination campaigns, which undermine public health and endanger others. Offit, author of *Deadly Choices: How the Anti-Vaccine Movement Threatens Us All*, said a lot of progress is being made, pointing out how the media came down hard on would-be presidential candidate Michele Bachmann when she made an outlandish claim about the HPV vaccine, which can prevent cervical cancer. At his hospital in Philadelphia, the flu vaccine is mandatory for all employees. He said the measles vaccine will get some public attention when unvaccinated people start dying of that disease.

• The symposium "Sleight of Mind" by neuroscientists Stephen Macknik and Susana Martinez-Conde and science journalist Sandra Blakeslee (coauthors of a recent book of the same title), plus James Randi on the neuroscience of magic. Macknik and Martinez-Conde have been studying how the world's great magicians employ ancient principles that can now be explained using the latest discoveries of cognitive neuroscience. Illusions dissociate perception from reality and reflect what the brain is actually doing. The scientists described numerous cognitive illusions, demonstrated the power of manipulated awareness, and showed that different effects are due to different circuits of the brain. Randi, the hero of his fellow skeptics, worked with the authors in their studies and followed their joint talk with his own personal views on the subject. "Magicians have to be aware of how they themselves think," he said, lamenting that "some magicians don't know at base how their tricks work." As for why he and other magicians don't tell you how their tricks are done, he gave his stock answer: "I want you to leave here knowing that you can be deceived." That is an invaluable lesson, he said. He called Macknik and Martinez-Conde pioneers in their field and "heroes" of his.

• The symposium on alternative medical claims featuring physician/skeptic luminaries Steven Novella, Harriet Hall, and Edzard Ernst. Hall punctured the acupuncture myth, including the widespread belief that acupuncture is an ancient practice ("current practices developed in the twentieth century") and showing that sham acupuncture works just as well. Novella ardently advocated science-based medicine and described a litany of biases that contribute to self-deception among patients and practitioners as well. Physicians themselves are susceptible to such clinical pitfalls as pattern recognition, relying on personal experience, elevating experience over evidence, failing to consider alternatives, becoming confused by nonspecific symptoms, and falling prey to confirmation bias ("I've seen it work"). Throw in problems with research such as publication bias, research bias, the decline effect, and the fact that preliminary studies are not as rigorous, and it is no wonder that, as medical researcher John Ionnidis has written, the majority of medical studies are wrong. Ernst has published a thousand papers in peer-reviewed journals, including 300 systematic reviews. "Many of these publications have disappointed enthusiasts of alternative medicine," he noted. "Some were outraged." He and his colleagues have examined studies funded by NCCAM, the National Center for Complementary and Alternative Medicine, and (as did authors of our January/February 2012 cover article on the topic) found many highly questionable. Regarding their studies of chiropractic, he found "questionable whether such re-

David Willey entertains awards banqueters; David Willey takes a sledgehammer to the chest (wielded by his assistant) in the name of skepticism; Vonnie Galligher and CFI Vice President of Outreach Lauren Becker enjoy the Smarti Gras party; Margaret Downey, founder of the Freethought Society, was a smash hit at the Smarti Gras party as the Tree of Life.

search is worthwhile." Rigorous studies of "energy medicine" were negative, hardly surprising since they were testing "implausible treatments." When Prince Charles, an advocate of alternative medicine, complained about Ernst to the chancellor of his university, Ernst lost most of his funding and team. Ernst defended himself successfully but at high cost. He said his work has "generated substantial bodies of evidence," much of it undermining assertions of alternative medicine, and made him "some friends, lots of enemies."

This is just a brief taste of the sessions that made CSICon New Orleans 2011 such a treat. There were also lively sessions on "The Investigators" (Joe Nickell, Massimo Polidoro, Karen Stollznow, and Ben Radford), "Death from the Skies" (Phil Plait, David Morrison, and Seth Shostak), "Science and Public Policy" (Chris Mooney and Ron Lindsay), "Feeling the Future" (Ray Hyman and James Alcock), "Evolution and Creationism" (Eugenie Scott and Barbara Forrest), "Skepticism and the Media" (Indre Viskontas, Sandra Blakeslee, and William B. Davis), "Superstitions and Hauntings" (Amardeo Sarma, Stuart Vyse, and Joe Nickell), "UFO Claims" (Robert Sheaffer and James McGaha), "Conspiracy Theories" (David Thomas, Robert Blaskiewicz, and Ted Goertzel), "Independent Investigation Groups," "Grassroots Activism and Outreach," "Educating the Next Generation," and a characteristically mind-bending lunch talk about frontiers of modern physics by physicist Lawrence Krauss.

It was exhausting but exhilarating, and we can hope there will be many more CSICons to come.

Kendrick Frazier is editor of the SKEPTICAL INQUIRER and a member of the Executive Council of the Committee for Skeptical Inquiry.

Critical Thinking in the Crescent City

KAREN STOLLZNOW

A Committee for Skeptical Inquiry (CSI) conference has been long-awaited since the last event held in 2003. The inaugural CSICon, the conference dedicated to scientific inquiry and critical thinking, was held October 27–30, 2011.

For such an event there simply is no better location than the French Quarter in New Orleans and simply no better time than the Halloween weekend. As I demonstrated in my talk "Making History," New Orleans is the most "haunted" city in the country (or at least one of the many "most haunted").

NOLA is famous for its music, cuisine, and Cajun and Creole culture, but it's also a city teeming with pseudoscience and the paranormal. Jackson Square has art galleries and museums but also resident psychics offering tarot, palm, and astrology readings. The French Quarter is infamous for the reputation of Bourbon Street, Mardi Gras, and Southern Decadence, but it's also known for its underbelly of voodoo, hoodoo, and Santeria. The city has a remarkable and vibrant history but is often best remembered for its folklore of ghosts, vampires, and Voodoo Queen Marie Laveau. The conference was a haven of rationalism, inquiry, and skepticism amid the myths and legends of the Big Easy.

CSICon featured an exciting array of dynamic speakers. These are people we've seen on television, whose writings we've read in books and copies of the SKEPTICAL INQUIRER, and who we've listened to on podcasts and radio shows. There were fascinating and informative talks presented by James

photos: Brian D. Engler

CSI Executive Council Member Leonard Tramiel chats with student Troy T. Obrero; Indre Viskontas reminds us immediatley dismissing someone's story can be counterproductive to skepticism; PZ Myers sports a CSICon T-shirt during his talk on Sunday; Ken Frazier welcomes the crowd at CSICon's introductory remarks.

Joe Nickell Has Asteroid Named After Him

It was a surprise announcement at the beginning of the Friday night awards banquet at CSICon New Orleans 2011. Astronomer and CSI scientific consultant James McGaha came forward and announced that an asteroid has been named for Joe Nickell in honor of his distinguished work on behalf of science, skepticism, and critical inquiry.

Nickell, the tireless investigator, prolific writer, and author who is CSI's senior research fellow, accepted the award. Asteroid 1999 CE10, discovered by McGaha on February 9, 1999, will henceforth be known as Joenickell. It is a main belt asteroid about five kilometers in diameter with a period of 3.44 years. The International Astronomical Union's Committee on Small Body Nomenclature oversees the official naming process using a set of well-defined guidelines.

Here is the citation:

31451 Joenickell = 1999 CE10

Named in honor of Joe Nickell (b. 1944), the Senior Research Fellow of the Committee for Skeptical Inquiry. A noted author, investigator, and skeptic, Nickell has written more than 30 books on mysteries, frauds, forgeries, and hoaxes. He promotes scientific inquiry and reasoned investigation of extraordinary claims.

Nickell joins several other prominent skeptics in having asteroids named for them. Previously Martin Gardner, James Randi, Carl Sagan, Ann Druyan, and Philip J. Klass were so honored (SI, July/August 1998; May/June 1999). Philosopher and CSICOP founder Paul Kurtz and CSICOP itself ("for its contributions to science education and skepticism") received the honor on CSICOP's twentieth anniversary (September/October 1996, p. 8). Others include P Z Meyers, Philip Plait, Michael Stackpole, and Rebecca Watson (September/October 2008).

James McGaha (center right) announces an asteroid has been named after CSI senior research fellow Joe Nickell (center left) while Eugenie C. Scott, Bill Nye, and Steven Novella approve.

Randi, Bill Nye, PZ Myers, Lawrence Krauss, and Indre Viskontas of the TV show *Miracle Detectives*. The conference was well-attended with over 300 people but intimate enough to enable personal conversations with speakers and fellow conference-goers.

CSI was well-represented by speakers from within its own ranks, including Fellows Phil Plait, Seth Shostak, Edzard Ernst, David Morrison, Dave Thomas, and Sandra Blakeslee; Executive Council members Eugenie Scott, Scott Lilienfeld, and James Alcock; and *Point of Inquiry*'s Chris Mooney.

Current, critical, and classical topics were tackled, including creation and evolution, science and public policy, investigations, UFO claims, conspiracy theories, alternative medicine claims, and grassroots activism and outreach. SKEPTICAL INQUIRER Editor Ken Frazier, CSI Executive Director Barry Karr, and Center for Inquiry President and CEO Ron Lindsay presented stirring speeches about the history and future of skepticism.

This was also a time for commendation. During a banquet dinner, Bill Nye received the "In Praise of Reason" Award and Steve Novella was presented with the Robert P. Balles Annual Prize in Critical Thinking. For his decades of investigative work, Senior Research Fellow Joe Nickell was recognized with an asteroid named after him. (See separate stories.)

CSICon encouraged knowledge-sharing and networking, but it wasn't all "work"; there was plenty of play with many unique extracurricular events. At the opening reception there was a performance by the Heathens, a band led by Jim Underdown of the Independent Investigations Group (IIG). David Willey, the "Mad Scientist," presented "How Does a Thing Like That Work?," an entertaining and interactive lecture consisting of the more visual and dramatic demonstrations from an introductory physics course.

One of the many highlights of CSICon was the Smarti Gras parade. It was a sight to behold—hundreds of skeptics in Halloween costumes led by a police escort and jazz band to the legendary Tipitina's jazz club. In true New Orleans style, passers-by joined in with the merriment, cheering us

along and even following the parade. We hope to have the same public reaction to our critical thinking!

This is what CSICon is about: showing that skepticism is not only important but also fun.

The party included music, dancing, jambalaya, and Halloween costumes. Blake Smith, of the IIG in Atlanta, won the best skeptically themed costume award for his "Occam's Shaving Cream" outfit.

Unlike in other conference reports, the cuisine deserves a mention too. CSICon departed from the usual bland conference fare, offering crab cakes with a spicy remoulade, eggs benedict with andouille, and an ice cream buffet with freshly made waffle cones.

The conference concluded with CSI's annual Houdini séance hosted by Joe Nickell. The session included talks by cold-reading expert Ray Hyman and psychic-buster Massimo Polidoro. Unfortunately but unsurprisingly, Houdini didn't turn up, yet again.

Disappointed that the festivities were over, enthusiastic skeptics continued the revelry with a post-conference tour of the beautiful flora and fauna of the Louisiana swamps and marshes.

In general, the conference was a wonderful opportunity to learn and share learning, reconnect with old friends, and establish new friendships. Attendees left the conference armed with new information and perspectives, reinvigorated to step outside of the conference hall and take skepticism to the streets.

This was a highly successful and refreshingly different conference. Negotiations are already underway for next year. It is rumored that CSICon 2012 is being planned to be even bigger and better and that CSICon is poised to become a preeminent skeptical conference for years to come.

Karen Stollznow is a CSI fellow and member of the CSI Executive Council. A linguist and researcher at the University of California, Berkeley, she also cohosts CFI's *Point of Inquiry* podcast, writes CSI's online "The Naked Skeptic" column, and is a SKEPTICAL INQUIRER contributing editor.

Where Meeting Awesome Skeptics Is As Easy As Saying 'Hello'

JULIA LAVARNWAY

Even before CSICon 2011 in New Orleans officially began, I was already having great conversations with skeptics from all over the country. While helping at the registration table I met SKEPTICAL INQUIRER readers and supporters from as close as a few blocks away from the conference hotel to as far away as the United Kingdom. It was amazing to see people from so many places convening in one place to celebrate reason, science, and skeptical inquiry.

It sure is something to be surrounded by so many like-minded people. Dorion Cable, who authored a great write-up on CSICon 2011 on her Detroit-based blog (http://bit.ly/CSIConMCB), commented that she recalls no place other than CSICon that people have actually recognized her Flying Spaghetti Monster necklace. But even some non–conference-goers had their interest piqued by the high concentration of skeptics. One hotel employee remarked, "You guys have the guy from the *X-Files* and Bill Nye the Science Guy? My nerd self just freaked out."

The first session after opening remarks on Thursday was "The Investigators" panel with stellar talks from Joe Nickell, Massimo Polidoro, Karen Stollznow, and Ben Radford on various investigations they've undertaken. Because the topic of women in the skeptics movement is of particular interest to me, I was happy that I was able to ask Karen Stollznow during the Q&A session after her talk if she has noticed any advantages or disadvantages to being a female

photo: Brian D. Engler

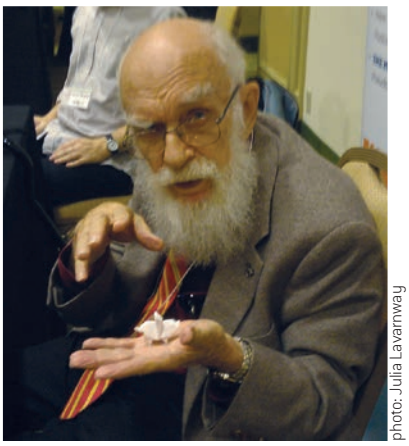

photo: Julia Lavarnway

photo: Adam Issak

photo: Brian D. Engler

Richard Saunders gets help from SI Deputy Editor Ben Radford during his talk on Power Balance; James "The Amazing" Randi conjures an origami Pigasus; Indre Viskontas and Karen Stollznow take a break from skepticizing to smile for the camera; SI columnist Steven Novella tries his luck in the costume contest, emceed by Skepchick Rebecca Watson, with his Dr. Horrible costume.

It was my conversations at CSICon about women in skepticism over dinner with Karen [Stollznow], *Miracle Detectives* star Indre Viskontas, and CFI Communications Director Michelle Blackley that inspired me to get more involved in the movement.

paranormal investigator—a minority within a minority. She answered that she hasn't noticed her gender making a big difference either way but that many of the people she meets tend to assume she is a believer.

Meeting Karen after many years of exchanging the occasional email was a conference highlight for me. As I gushed on my Twitter page: "Finally met @karen stollznow in person! She's just as awesome as I knew she'd be." It was my conversations at CSICon about women in skepticism over dinner with Karen, *Miracle Detectives* star Indre Viskontas, and CFI Communications Director Michelle Blackley that inspired me to get more involved in the movement and to start the blog *We Are SkeptiXX* (http://bit.ly/skeptixx).

Phil Plait's talk on the "Death from the Skies!" panel on Friday had me in stitches. "How do you keep [asteroids from hitting the Earth]?" he asked his captivated audience. "Well, if you ask Hollywood . . . you will get the wrong answer." After showing a clip from the horribly inaccurate 1998 movie *Armageddon*, Plait pointed out that perhaps the most ludicrous detail in the scene is the fact that it is violently raining on the asteroid as Bruce Willis attempts to get the bomb into place. What's wrong with that? Just the little fact that asteroids don't have their own atmospheres and therefore there is no weather on them. I was able to talk with Plait for a couple minutes and compliment him on his ability to make his talks so enjoyable. He told me of a college professor he once had who during his classes would literally play a recording of himself giving a lecture. The memory of having to sit through those "lectures" is one of the things that motivate Plait to ensure that all of his own talks are engaging and entertaining.

Another highlight of the conference was once again seeing CSI Fellow James Randi—they sure don't call him "The Amazing" for nothing. His talk during the "Sleights of Mind" panel on Friday was nothing short of inspiring. He reminded us all that no matter how much pride we take in our skepticism and critical thinking skills, every one of us can fall prey to tricks and smoke and mirrors: "I don't tell you how the tricks are done for a very simple reason . . . I want you to know that you *can* be deceived." One of my very favorite conference keepsakes is a picture I was able to snap of Randi "conjuring" CSI Fellow Richard Saunders's famous origami Pigasus, the mascot of the James Randi Educational Foundation (JREF).

Another panel I really enjoyed was Saturday's "Skepticism and the Media," which featured William B. Davis of *X-Files* fame, *Miracle Detectives* star Indre Viskontas, and *New York Times* science writer Sandra Blakeslee. Led by CFI Communications Director Michelle Blackley, it was the first CSI/CSICOP conference panel with a female moderator. After Davis's engaging talk in which he admitted he once unknowingly agreed to moderate a panel of 9/11 Truthers—"You must do your homework!" he reminded us—Indre Viskontas wondered aloud, "How can I follow Cancer Man? Well, at least I wore my cigarette pants." On a more serious note, she went on to remind us all that "It is counterproductive to dismiss someone's story off the bat," a mistake that she has seen some skeptics make. As Viskontas told Sharon Hill in her SI interview (November/December 2011), "Once you've dismissed them, you've lost them. They don't want to talk to you anymore."

CSI Fellow Richard Saunders, Life Member of the Australian Skeptics and the sole skeptical judge on Australia's psychic-seeking reality show *The One*, was another delight to meet. I think *ebullient* is the best word to describe Richard. You'd be hard up to meet a more enthusiastic and personable skeptic. Richard not only allowed me to film him creating a JREF Pigasus (http://bit.ly/Saunders Origami), he also invited me to appear on *The Skeptic Zone* podcast (http://bit.ly/skepticzone158). His Sunday presentation debunking Power Balance bands, in which he had some help from SI Deputy Editor Ben Radford in the form of audience participation (http://bit.ly/powerbalancedemo), was a big hit. (See also, "Power Balance Down and Out in Australia," SI, September/October 2011 and "Power Balance Bracelets a Bust in Tests," SI, January/February 2012).

My vote for "quote of the conference" came from SI Editor Ken Frazier during the close of his opening remarks on Thursday: "One of the secrets we've kept from the public all these years is that skepticism is not just important, it's also fun!" CSICon 2011 in New Orleans certainly proved the truth of Ken's aphorism. Where else but CSICon would I have had the opportunity to have incredibly interesting conversations with luminaries in the skeptics movement while fast-dancing with the "big boss," CFI president and CEO Ron Lindsay; rockin' out to the Heathens (led by Independent Investigations Group founder Jim Underdown); eating ice cream with the eminent Massimo Polidoro; and admiring the awesomeness that was Steven Novella's Dr. Horrible costume for the "Smarti Gras" party? I will most definitely be back at CSICon 2012, and I hope to meet even more of you SI readers and supporters there.

Julia Lavarnway is the managing editor of the SKEPTICAL INQUIRER and the "News and Views" columnist for the *Secular Humanist Bulletin*, *Free Inquiry*'s quarterly newsletter. In December 2011 she founded the blog *We Are SkeptiXX* (http://bit.ly/skeptixx) to help support women in the skeptics movement.

Bill Nye Wins In Praise of Reason Award; Novella Presented with CSI Balles Prize

Bill Nye "The Science Guy" received the In Praise of Reason Award, the highest award of the Committee for Skeptical Inquiry, at the CSICon New Orleans 2011 conference awards banquet.

The In Praise of Reason Award is given in recognition of distinguished contributions in the use of critical inquiry, scientific evidence, and reason in evaluating claims to knowledge. Previous recipients include Carl Sagan, Stephen Jay Gould, Martin Gardner, Ray Hyman, James Randi, and Nobel laureate physicists Murray Gell-Mann and Leon Lederman, among others.

Nye has a long string of television credits that promote good science, starting with his Emmy Award–winning 1990s series *Bill Nye the Science Guy*. An aeronautical engineer by training and early experience, Nye drew on his scientific and engineering background as a solid foundation for his demonstrations of scientific principles that are at the core of his communication of science to the public.

Subsequent programs include *The Eyes of Nye*, *100 Greatest Discoveries*, *Greatest Inventions with Bill Nye*, and *Stuff Happens*. His Bill Nye's Climate Lab is a new permanent exhibit at the Oakland, California–based Chabot Space and Science Center.

Nye is now the executive director of the Planetary Society in Pasadena, California.

"If you think Bill is popular among skeptics, you should attend a science teacher conference where he is speaking," said Eugenie C. Scott, a member of CSI's Executive Council, in presenting the award. "The National Science Teachers Association draws upwards of 12,000 [to] 15,000 teachers; I think all of them attend his talks, because although the organizers schedule his lecture in the largest ballroom in the conference center, there still are people standing in the back and in the aisles.

"It is obvious why," said Scott, executive director of the National Center for Science Education. "Ken Frazier spoke at the opening ceremonies about the sense of exhilaration that skeptics feel in enjoying science—and that skepticism is 'fun.' Hardly anyone has as much fun as Bill Nye when he is talking about, and especially when he is demonstrating, principles of science.

"If you have seen any of his programs discussing astrology or other, to quote Carl Sagan, 'extraordinary claims,' you will soon see why he was made a fellow of the Committee for Skeptical Inquiry. He is a longtime skeptic and proponent of critical thinking—obvious in all of his television programs."

"Ken Frazier spoke at the opening ceremonies about the sense of exhilaration that skeptics feel in enjoying science—and that skepticism is 'fun.' Hardly anyone has as much fun as Bill Nye when he is talking about, and especially when he is demonstrating, principles of science."
— Eugenie C. Scott

* * *

Steven Novella was presented with CSI's Robert P. Balles Annual Prize for Critical Thinking at the same awards banquet. The $1,500 award is given to the author of the published work or body of work that best exemplifies healthy skepticism, logical analysis, or empirical science. The award, previously announced (SI July/August 2011), was presented by CSI Executive Council member and Skeptical Inquirer Editor Kendrick Frazier.

In his case, Novella was honored not for a particular article or publication but instead for his "tremendous body of work," including the *Skeptics' Guide to the Universe* weekly science podcast, the *Science-Based Medicine* blog, his *Neurologica* blog, his Skeptical Inquirer column, "The Science of Medicine," and his tireless travel and lecture schedule on behalf of skepticism.

"You may be the hardest worker in all of skepticism," CSI Executive Director Barry Karr said when he first announced the award. "We are honored to present you with this award."

Novella is a clinical neurologist, assistant professor, and director of general neurology at the Yale University School of Medicine. He is a fellow of the Committee for Skeptical Inquiry.

photo: Brian D. Engler

photo: Adam Issak

Bill Nye "The Science Guy" (left) received CSI's In Praise of Reason Award. Steven Novella (right) is keeping his CSI Balles Prize tucked safely under his arm.

[INVESTIGATIVE FILES JOE NICKELL

Joe Nickell, PhD, is CSI's senior research fellow and author of such books as *Inquest on the Shroud of Turin, Relics of the Christ,* and *Looking for a Miracle.*

Traditional Chinese Medicine: Views East and West

Perhaps no gulf between the East and the West is more significant than in theories and practices concerning medicine. In October 2010 I had a wonderful opportunity—as a visiting scholar in an annual exchange program between the Center for Inquiry (CFI) and the China Research Institute for Science Popularization (CRISP)—to take a look at Chinese healing techniques. I toured the Museum of Traditional Medicine at Beijing University of Chinese Medicine (guided by two doctoral students), visited two clinics that used traditional methods (at one I even underwent acupuncture and a related technique) and the pharmacy connected to one of them, and made other related explorations. Here is some of what I found.

Figure 1. The author researches ginseng at the Museum of Traditional Chinese Medicine.

The Origins

One of the oldest forms of medical practice, Chinese medicine had ancient antecedents that are lost to history. Archaeological evidence of magical practices—including divination to determine the will of one's ancestors, who were considered a major cause of illness (along with environmental factors, such as snow and, especially, wind)—dates from as early as the Shang Dynasty (1766–1122 BCE). Still, the system that would develop into traditional Chinese medicine stems from the Han Dynasty (206 BCE–219 CE) (*Ancient Healing* 1997, 278, 282–83).

China's oldest medical text, the *Huangdi Neijing* (or "Yellow Emperor's Inner Canon"), stems from circa 200 BCE, when it was probably compiled by several different people rather than the mythical Huang Di (who supposedly lived from 2698 to 2598 BCE—a convenient one hundred years). It influenced future generations of medical theorists and is still cited in support of today's Chinese medicine (*Ancient Healing* 1997, 282). (It also laid the foundation for most Asian medicine—that of Japan, Korea, the Philippines, and other Asian countries—although India developed its own medical system, Ayurveda [Monte 1993, 20].)

Traditional Chinese medicine is based on a pair of central concepts. The first, the Doctrine of Two Principles, holds that there are two opposing forces—*yin* and *yang*—that combine in various ways to create all phenomena. Yin and yang's attraction creates an energy called *qi* (pronounced "chee"), which is held to be the life force permeating the entire universe. In the body, where it supposedly flows through certain channels called meridians, an imbalance of qi causes illness.

The second key concept in Chinese medicine is that of the Five Elements: wood, fire, earth, metal, and water, each associated with a particular planet, one of the five Chinese seasons, and a pair of the body's organs, among other associated qualities. Traditional Chinese medicine is a complex system that combines these two main concepts with other diagnostics. Various treatments—the use of herbs, acupuncture, and other means—are intended to balance qi and thus restore health (Monte 1993, 19–29; Porter 1997, 94–113; *Ancient Healing* 1997, 296–98).

Materia Medica

An entire floor of the Museum of Traditional Chinese Medicine is devoted to eastern *materia medica* (Latin for "medical matter"), the herbs and other natural substances used for making traditional medicines. The impressive collection of 2,850 substances includes 300 taxidermy specimens; fish, starfish,

turtles, owls, snakes, and bear, for example, all have their purpose. Powdered deer antler, for instance, is prescribed for women's menstrual problems. Among several ancient pharmacopoeia to survive in some version, the principle one is a sixteenth-century herbalism text by a physician named *Li Shih-chen*. It describes nearly 2,000 herbs and provides some 10,000 herbal remedies (Shealy 1996, 32).

Among the museum's extensive collection of herbs (the bulk of the *materia medica*) is a display of both eastern ginseng (*Panax ginseng*) and American ginseng (*Panax quinquefolius*) (Figure 1). I found this of particular interest because as a boy growing up in eastern Kentucky I knew rural "'sang" hunters who dug, dried, and sold the root to meet the East's insatiable demand for an herbal remedy used to treat any lack of vitality, including impotence. In China, I sampled ginseng tea in tea houses and "tonic soup" in restaurants (including "pigeon with ginseng," said to be efficacious for "regulating one's energy, strengthening one's body," according to the menu description).

Ginseng's root is often forked, giving it a vague semblance of a person's body. It is probably because of this shape (the English word *ginseng* is derived from a Chinese term meaning "man root") that medicinal properties were first attributed to the plant. The genus name *Panax* is Greek for "all-heal," the same origin as *panacea* (Chevalier 1996, 25, 116; Encyclopedia Britannica 1960, s.v. "ginseng").

Whereas western herbalists typically prescribe a single herb at a time, Chinese and other Asian therapists may concoct a mixture of medicinal substances—vegetable, animal, mineral—tailored to a particular person and condition. Each ingredient is based on its qi or energy value (said to be hot, warm, cold, cool, or neutral) (Shealy 1996, 72).

While herbs have a definite place in modern science-based medicine—some mainstream medical compounds are derived from plant sources—the efficacy and safety of each plant must be determined through double-blind clinical trials before it can be deemed suitable for medical use. Although many people believe "natural" medicines are inherently safe, the fact is that there are important safety issues of drug interaction, contamination, dosage, and other concerns, including the fact that use of an ineffective medicine means that expected health benefits are not realized. There is also the risk of long-term adverse effects with some herbs (Porter 1997, 92–93).

Figures 2–3. The author undergoes "cupping" treatment (shown here), together with acupuncture, at a Beijing clinic. (Photos by Joe Nickell)

Acupuncture

Even more important than herbalism is acupuncture, "the preeminent form of therapy in Chinese medicine" (Monte 1993, 23). Among the oldest therapies still in use, it consists of inserting needles at any of over 350 "acupoints," which are supposedly located along invisible meridians through which qi flows. The purpose is to drain any excess of qi, remove blockages, and stimulate the flow of qi, thus correcting imbalances and thereby treating illnesses (Porter 1997, 19; Shealy 1996, 31).

Acupuncture, however, has begun to be subjected to the rigors of science with generally negative results. The existence of neither qi nor the meridians through which it is supposedly carried has been proven, notwithstanding the claims made from faulty studies. As to the efficacy of the treatment, evidence is mounting that previous positive studies are flawed and that acupuncture lacks intrinsic clinical value.

Researchers have demonstrated that "sham" acupuncture (i.e., phony treat-

ments using incorrect acupoints or needles that retract like the blades of stage knives) can work as well as real acupuncture. (See Steven Novella's "What Is Acupuncture?" SI, July/August 2011). In fact, acupuncture appears to be no more successful in relieving pain than can be attributed to the placebo effect, and there is no credible evidence that acupuncture is effective in treating any other medical condition (Slack 2010).

Some additional Chinese medical treatments are related to acupuncture. There is *acupressure*, a needle-less form that "involves the surface stimulation of acupoints digitally, manually, or with tools held in the hand" (Raso 1996, 4); *moxibustion*, the burning of moxa (dried leaves of *Artemesia vulgaris*) to apply heat to acupuncture points (Shealy 1996, 31); and *cupping*, whereby a vacuum is created in a cup (by burning combustible material inside it) that is quickly placed on the patient's body, often at an acupoint (see Figures 2 and 3).

Acupuncture, herbalism, and other aspects of traditional Chinese medicine are viewed with nationalistic pride, not unlike the art of Chinese brush calligraphy, and criticism of it is often met with some defensiveness. Nevertheless, the practice appears to be slowly declining in China—just as, ironically, it has been gaining favor among New Agers in the West. Meanwhile, as an advanced doctoral student at the Beijing University of Chinese Medicine admitted to me, Chinese traditional medicine and Western medicine are not well integrated but function in a rather parallel manner; the practice is to use both. In other words, one might be given a Western diagnosis that included labwork followed by prescription of an antibiotic *and also* separately be given acupuncture treatment, based on looking at the patient's tongue and taking his or her pulse, coupled with an herbal concoction. One hopes that in both hemispheres, science-based medicine—not "Western" medicine—will prevail.

Acknowledgments

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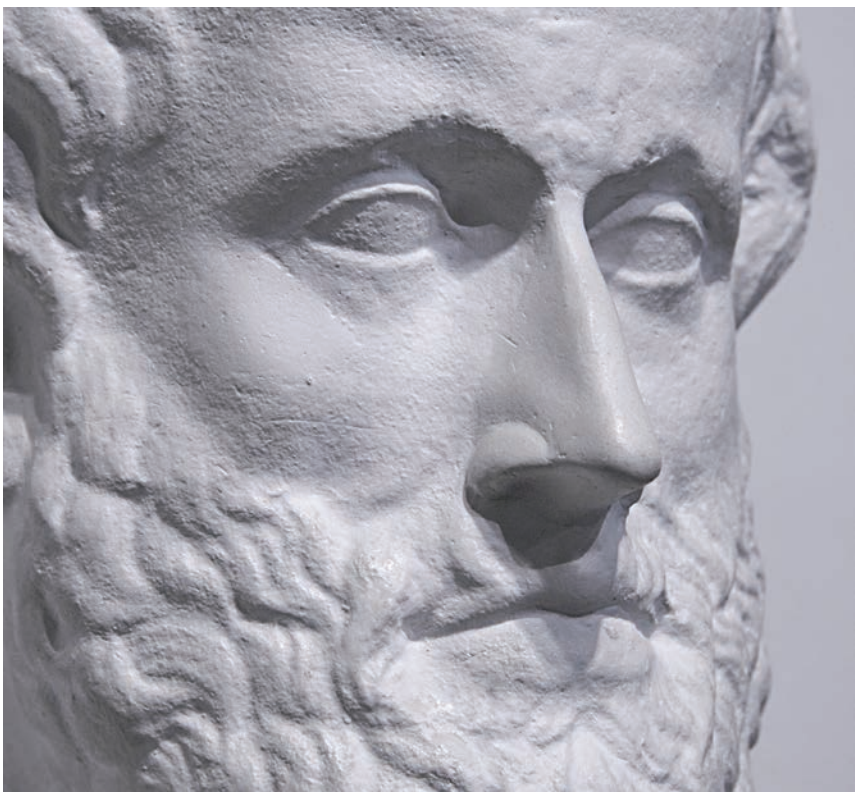
[THINKING ABOUT SCIENCE MASSIMO PIGLIUCCI

Massimo Pigliucci is professor of philosophy at the City University of New York–Lehman College, a fellow of the American Association for the Advancement of Science, and author of *Nonsense on Stilts: How to Tell Science from Bunk*. His essays can be found at www.rationallyspeaking.org.

Human Nature

Recently I participated in a spirited discussion with a colleague and a number of graduate students on the concept of human nature. This is one of those ideas that clearly stands at the interface between science and philosophy toward which scientists and philosophers tend to have different perspectives at different times. If my reading of the current zeitgeist in both areas is correct, many scientists will find the existence of something like human nature somewhat uncontroversial, while many philosophers will think of it as problematic—with a good number of exceptions in both camps, of course.

To begin with, the whole enterprise of evolutionary psychology presupposes the existence of human nature, a set of human (and only human) universals that evolved during the so-called evolutionarily relevant environment (roughly speaking, the Pleistocene) with which we are still stuck today. It is human nature in this sense—according to evopsych theory—that explains why we display all sorts of maladaptive behaviors in modern society, like the rampant obesity epidemic, possibly caused by an ancestral craving for fats and sugars that persists even in a culture of cheap food available around the clock. I don't put too much stock in evopsych just-so stories in general (see "Thinking about Science," SI, March/April 2006), but still it is hard to deny that there are certain human biological and cultural characteristics that are indeed universal, or nearly-so. They distinguish us from other species at least quantitatively, if not qualitatively (think of human language and of how much more sophisticated it is than any other animal's communication system).



Philosophers these days tend to be skeptical of talk of human nature because of its association with a (largely) discredited view in biology known as essentialism. Human beings—like every other species—are the ever-changing product of evolution, which means that any difference between us and the rest of the animal world is both a matter of degree and temporary, neither property being particularly friendly to the idea of *Homo sapiens* possessing an intrinsic "nature." Then again, some philosophical theories do depend on an identifiable common nature for humanity; for instance, virtue ethics, which traces back its roots to Aristotle. Virtue ethicists think that the point of morality is to ask the question "What kind of life should I live?," to which they respond that it is the life that increases human flourishing. But human flourishing as conceived by virtue ethicists assumes, as Aristotle did, that all normal members of the species seek the same ultimate goals, as much as they will go about achieving them in culturally specific ways. That is, virtue ethics seems to presuppose human nature.

Discussions concerning human nature are usually framed in a manner similar to debates about nature and nurture with the "naturists" typically being sympathetic to the idea and "culturists" counting themselves among the skeptics. But if there is anything that the nature/nurture debate has shown us by now, it is that the actual answer lies somewhere in the middle—or more properly in the interaction between the two. Genes by themselves literally do nothing; they need very specific environmental contexts, as well as an unfolding process of development, in

order to give rise to the next generation of organisms. However, by the same token environments and developmental processes need the highly specific information provided by genes and other heritable elements; otherwise the whole thing doesn't even get started. Could it be that the debate about human nature has been missing a similar type of middle ground?

As it turns out, this is not a new idea. It goes back at least to eighteenth-century philosopher David Hume, who was involved in a controversy about the nature of human sociability. Two major and diametrically opposed views were being championed: on the one hand, Bernard de Mandeville, among others, argued that sociability is rooted in self-interest; that is, people agree to be members of a society exclusively so long as it furthers their own well being. On the other hand, Francis Hutcheson and Anthony Shaftesbury, for instance, maintained that the origin of human sociability is to be found in a natural sense of benevolence. What the two views had in common was that they were both originalist about human nature: once the latter got set (presumably by God, since the debate took place in pre-Darwinian times) it stayed that way. Hume thought otherwise and developed instead a dynamic ("progressive") view of human nature, allowing original motives to evolve into motives of a different kind. According to Hume, people initially cared about justice in their own self-interest. But over time they developed "mental associations" that led them to approve of justice (and disapprove of injustice) even when it doesn't serve their self-interest. In modern terms we would say that the basic biological nature of humanity is capable of cultural evolution.

Hume's basic idea strikes me as full of potential, but it hasn't been developed very far for the simple reason that we still, by and large, lack a good theory of cultural evolution. As readers of this column may recall, I put little stock in so-called memetics ("Thinking about Science," SI, March/April 2008), and while much work has been done about the structure of human culture, no overall theory comparable to Darwinism has emerged so far. (Notable attempts include the concept of gene-culture coevolution developed by Feldman, Cavalli-Sforza, et al. in the 1970s and 1980s and current work by Pascal Boyer and similar scholars, particularly on the evolution of religion.) Perhaps Hume anticipated in some sense the sentiment of Albert Camus when he said, "Man is the only creature who refuses to be what he is." But can we at least try to understand who we are?

[NOTES ON A STRANGE WORLD MASSIMO POLIDORO

Massimo Polidoro is an investigator of the paranormal, lecturer, and cofounder and head of CICAP, the Italian skeptics group. His website is at www.massimopolidoro.com.

The Day Houdini (Almost) Came Back from the Dead

After magician and skeptic Harry Houdini died on October 31, 1926, scores of mediums claimed they had received a genuine message from the "soul" of the once-great skeptic and medium-basher. However, they could offer no convincing proof for such a fantastic claim. An apparently more convincing candidate, however, soon appeared on the scene. The name of the medium was Arthur Ford (1897–1971), a pastor of the First Spiritualist Church in New York City.

Ford claimed that on February 8, 1928, he went into a trance and, talking in the voice of "Fletcher," his spirit guide, he said that a woman identifying herself as the mother of Harry Houdini was anxious to speak. The spirit stated that her son, Harry, had hoped for years to receive one particular word from her, the word *forgive*, and added that "his wife knew the word, and no one else in all the world knew it."

Forgive was, presumably, the last word uttered by Houdini's mother on her deathbed and did probably refer to one of Houdini's brothers, Leopold, who had been "guilty" of marrying Sadie, the ex-wife of Nathan, another Houdini brother. To the magician, this behavior had appeared morally inexcusable and led to the "removal" of Leopold from his life. He could have not forgiven his brother unless his mother told him to; however, her death came before the matter could be discussed.

On learning of Ford's message, Bess promptly wrote the following to Ford:

> Strange that the word *forgive* is the word Houdini awaited in vain all of his life. It was indeed the message for which he always secretly hoped, and if had been given to him while he was still alive, it would I know have changed the entire course of his life—but it came too late. Aside from this there are one or two trivial inaccuracies—Houdini's mother called him Ehrich—there was nothing in the message which could be contradicted. I might also say that this is the first message which I have received which has an appearance of truth.

A poster for Houdini's campaign against fraudulent mediums.

Ford's supporters announced that Bess's letter confirmed the authenticity of the message, since the word *forgive* could only be known by Houdini, his mother, and his wife. Sir Arthur Conan Doyle, typically, considered the message genuine and "an outstanding case." The public, however, remained skeptical. The press, in fact, reported that the keyword had already appeared in print nearly a year before, on March 13, 1927, in the *Brooklyn Eagle*. In an interview she had given to the paper, Bess had specified that any authentic communication purporting to come from Houdini would have included the word *forgive*. Furthermore, it was not true, as the "spirit" of Houdini's mother had said, that "no one else in all the world" besides her, Houdini, and Bess knew of the word; at the time of her death, in fact, her magician son was touring Europe with his wife. The son who was at Mrs. Houdini's deathbed was Theodore.

A few months later, on January 5, 1929, Ford announced that he had received the tenth and final code word of a message from Houdini. The following day, accompanied by members of his church, Ford went to Payson Avenue, where Bess had moved after Houdini's death. They found Bess lying on a couch, suffering from a fall down a flight of stairs—probably provoked by a drinking habit she had developed. In an account written for the *New York Evening Graphic* before Ford's visit, Bess was described as being in a "semidelirium," calling for Houdini to return. She blacked out from time to time and was "under constant care of physicians." It was in this state, then, that Ford's message was read to her; it stated: "Rosabelle, answer, tell, pray-answer, look, tell, answer-answer, tell."

A séance was fixed for January 8, shortly after noon. Ford went into a trance and began speaking through what he claimed was Houdini's voice. The voice repeated the message and then said: "Thank you, sweetheart, now take off your wedding ring and tell them what 'Rosabelle' means." Bess, lying on a sofa, took off her ring and began to sing: "Rosabelle, sweet Rosabelle, I love you more than I can tell. Over me you cast a spell. I love you, my sweet Rosabelle."

Ford, still speaking as Houdini, explained that "Rosabelle" was the song

(The medium) insisted that Bess issue another statement (endorsing the veracity of the message). It was written on Bess's personal stationery but by someone else, as the handwriting reveals.

sung by his wife in their early days. The other code letters in the message formed the word "*believe*." Before leaving, the purported voice of Houdini said: "Spare no time or money to undo my attitude of doubt while on earth. Now that I have found my way back, I can come often sweetheart. Give yourself to placing the truth before all those who have lost the faith and want to take hold again. Believe me, life is continuous. Tell the world there is no death. I will be close to you. I expect to use this instrument [Ford] many times in the future. Tell the world, sweetheart, that Harry Houdini lives and will prove it a thousand times."

The secret code was the one used by Houdini and Bess when, in the early days of their career, they used to present in their show a telepathy act similar to others of the time. The code consisted of ten units with each unit standing for a digit and each digit, in turn, representing the position in the alphabet of a letter in the coded message:

Pray = 1 = A
Answer = 2 = B
Say = 3 = C
Now = 4 = D
Tell = 5 = E
Please = 6 = F
Speak = 7 = G
Quickly = 8 = H
Look = 9 = I
Be quick = 10 or 0 = J

Double-digit letters were indicated by combinations of the code words. For example, the fourteenth word, N, would be signaled by the phrase "pray (1), now (4)." In Ford's message the nine words following "Rosabelle" formed the word *Believe* in this manner: Answer (B), tell (E), pray-answer (L), look (I), tell (E), answer-answer (V), tell (E).

Ford's group insisted that Bess issue another statement. It was written on Bess's personal stationery but by someone else, as the handwriting reveals. She was then asked to sign it. It read: "Regardless of any statements made to the contrary, I wish to declare that the message in its entirety and in the agreed-upon sequence, given to me by Arthur Ford is the correct message pre-arranged between Mr. Houdini and myself."

Not everybody was convinced, however. Magician, mentalist, and friend of Houdini Joseph Dunninger went to Bess's house and reminded her that the "secret code" had not been secret since its publication, the previous year, on page 105 of *Houdini, His Life Story*, the authorized biography written by Harold Kellock and based on Bess's "recollections and documents."

"I have seen it stated in the papers," Doyle would later write to Kellock on this point, "that this accounts for Ford getting a posthumous message. This, however, I am sure you realize, is not correct. It was not the cipher that formed the test, but it was the message which was written in the cipher, and Ford could not have got that out of your book."

photo: http://houdinihimself.com

A portrait of Houdini with his wife, Bess.

Bess, however, had stated to the *New York World* on January 9: "I had no idea what combination of words Harry would use and when he sent 'believe' it was a surprise." Also, the fact that Houdini had had four lines of the song "Rosabelle" engraved inside Bess's wide gold wedding ring was hardly a secret.

"The Message is a Hoax!"

Two days after the séance, the notorious scandal-sheet, the *New York Evening Graphic*, headlined: "HOUDINI MESSAGE A BIG HOAX!—'Séance' Prearranged by 'Medium' and Widow." The allegation was that Bess herself had given Ford the code in order to promote a lecture tour that the two were supposed to do together. The news caused an uproar, and Bess, still ill, wrote a moving letter to Walter Winchell, a columnist of the *Evening Graphic*:

> This letter is not for publicity, I do not need publicity. I want to let Houdini's old friends know that I did not betray his trust. I am writing this personally because I wish to tell you emphatically that I was no party to any fraud.
>
> Now regarding the séance: For two years I have been praying to receive the message from my husband; for two years every day I have received messages from all parts of the world. Had I wanted a publicity

The medium Arthur Ford at the bed of a sick Beatrice Houdini. She can be seen in the bed with her head bandaged.

The cover of a 1928 booklet detailing Houdini's spirit exposés.

stunt I could no doubt have chosen any of these sensational messages. When I repudiated these messages no one said a word, excepting the writers who said I did not have the nerve to admit the truth.

When the real message, *the* message that Houdini and I agreed upon, came to me and I accepted it as the truth, I was greeted with jeers. Why? Those who denounce the whole thing as a fraud claim that I had given Mr. Arthur Ford the message. If Mr. Ford said this I brand him a liar. Mr. Ford has stoutly denied saying this ugly thing, and knowing the reporter as well as I do I prefer to believe Mr. Ford. Others say the message has been common property and known to them for some time. Why do they tell me this now, when they know my heart was hungry for the true words from my husband? The many stories told about me I have no way to tell the world the truth of or the untruth, for I have no paper at my beck and call; everyone has a different opinion of how the message was obtained. With all these different tales I would not even argue. However, when anyone accuses me of *giving* the words that my husband and I labored so long to convince ourselves of the truth of communication, then I will fight and fight until the breath leaves my body.

If anyone claims I gave the code, I can only repeat they lie. Why should I want to cheat myself? I do not need publicity. I have no intention of going on the stage or, as some paper said, on a lecture tour. My husband made it possible for me to live in the greatest comfort. I do not need to earn money. I have gotten the message I have been waiting for from my husband, how, if not by spiritual aid, I do not know.

And now, after I told the world that I have received the true message, everyone seems to have known of the code, yet never told me. They left it to Mr. Ford to tell me, and I am accused of giving the words. It is all so confusing. In conclusion, may I say that God and Houdini and I know that I did not betray my trust. For the rest of the world I really ought not to care a hang, but somehow I do, therefore this letter. Forgive its length.

Sincerely yours,
Beatrice Houdini

When it became known that Ford was using a copy of Bess's signed statement in some of his advertisements, Bernard M.L. Ernst, Houdini's and then Bess's lawyer, saw the possibility of a lawsuit against Ford. In reply, Bess wrote to him:

> I wish to say that I did sign the letter. . . . I did not say that I believed that the message came through spiritual aid or that I believed in spiritualism. I did say the words I heard were the words I expected to hear, etc. . . . I had a copy of the original letter I wrote to him somewhere but I am too ill to look for it and I really don't care. I never said I believed the letter came from Houdini. I never said I believed in spiritualism and I still say the same. I don't care what Sir Arthur Conan Doyle or Will Goldston say or do. I don't and never did believe the message genuine nor did I believe in spiritualism. I will write you clearly later if you will just give me a chance to get well. I don't care what you do to or about Mr. Ford.

Ernst didn't bring Ford to court, but the medium was, nonetheless, expelled from the United Spiritualist League of New York. At least for a short while; shortly afterward he was reinstated "on the ground of insufficient proof" as to his possible fraud.

Bess disavowed Ford's message countless times. "There was a time," she told an interviewer later in her life, "when I wanted intensely to hear from Harry. I was ill, both physically and mentally, and such was my eagerness that spiritualists were able to prey upon my mind and make me believe that they had really heard from him."

On March 19, 1930, Bess also asked Ernst to issue a statement reading thus: "For three years she had sought to penetrate beyond the grave and communicate with her husband, but had now renounced faith in such a possibility: she denied that any of the mediums presented the clew [clue] by which she was to recognize a legitimate message."

And so Houdini, who for a little while had appeared to have returned from the afterlife, was finally let to rest in the only inescapable prison that was able to hold him: death.

[PSYCHIC VIBRATIONS ROBERT SCHEAFFER

Sheaffer's "Psychic Vibrations" column has appeared in the Skeptical Inquirer for more than thirty years; its highlights have now been published as a book (Create Space 2011). Sheaffer blogs at www.BadUFOs.com, and his website is www.debunker.com.

Disclosure by the Dozens

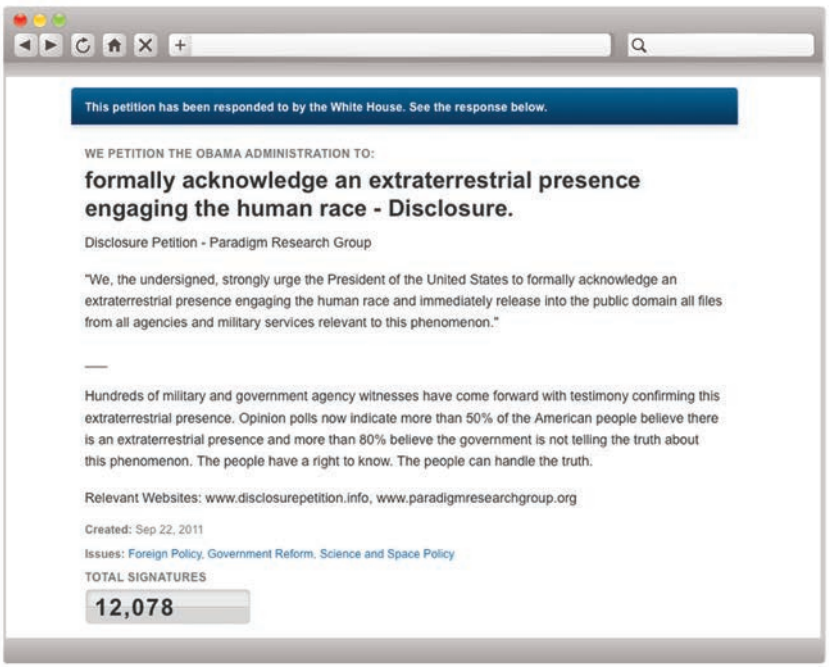
You may recall that UFO activists declared July 8, 2011, the first annual "World Disclosure Day" (http://tinyurl.com/76jwal9). That date was chosen because it's the anniversary of what they see as the beginning of the supposed Roswell crash cover-up. According to AOL Weird News, Stephen Bassett, the executive director of the Paradigm Research Group (PRG), is "a registered lobbyist who runs the Extraterrestrial Phenomena Political Action Committee [http://www.x-ppac.org], an organization that since the late 1990s has been demanding Congress release information about the presence of aliens as soon as possible." Bassett says, "There was an arms race, a space race, and now we have a disclosure race. There are a dozen or so countries that might well effect disclosure tomorrow. It is hoped the Obama administration will become aware of this and take action." However, the Big Oil companies are pressuring the government to keep secret the free energy that alien technology offers us. So here we are, sixty-four years later, and the U.S. government still has not "disclosed" the presence of aliens all around us.

When the Obama administration launched its "We the People" petition program (https://wwws.whitehouse.gov/petitions), they probably never expected to get a petition like this. Signers were promised that the administration would give a formal response to any petition gathering 5,000 signatures within thirty days. One of the very first petitions to qualify for a response was the so-called disclosure petition, "We petition the Obama administration to: formally acknowledge an extraterrestrial presence engaging the human race—Disclosure." The petition, written by Bassett, states:

> We, the undersigned, strongly urge the President of the United States to formally acknowledge an extraterrestrial presence engaging the human race and immediately release into the public domain all files from all agencies and military services relevant to this phenomenon.

This goes well beyond a request for simple disclosure, calling for the release of all documents. It presupposes that the U.S. government is involved in ongoing contact with extraterrestrials and demands that the Obama administration acknowledge that fact. However, the petition quickly gathered enough signatures to qualify, creating a dilemma for the White House. All goverment officials could do is deny that they are meeting with extraterrestrials on a daily basis, and of course denial further fans conspiracy flames. For a government agency to address UFO claims in any way is an automatic no-win situation. If you say they're not a real mystery, you get a controversy over that. On the other hand, if you say that UFOs are mysterious and challenging, you stir up an even bigger controversy; many people may suspect (quite reasonably) that you have been nibbling peyote or something.

On November 7, the White House finally issued its response to the Disclosure Petition, which reads, in part: "Thank you for signing the petition


This petition has been responded to by the White House. See the response below.
WE PETITION THE OBAMA ADMINISTRATION TO:
formally acknowledge an extraterrestrial presence engaging the human race - Disclosure.
Disclosure Petition - Paradigm Research Group
"We, the undersigned, strongly urge the President of the United States to formally acknowledge an extraterrestrial presence engaging the human race and immediately release into the public domain all files from all agencies and military services relevant to this phenomenon."
Hundreds of military and government agency witnesses have come forward with testimony confirming this extraterrestrial presence. Opinion polls now indicate more than 50% of the American people believe there is an extraterrestrial presence and more than 80% believe the government is not telling the truth about this phenomenon. The people have a right to know. The people can handle the truth.
Relevant Websites: www.disclosurepetition.info, www.paradigmresearchgroup.org
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TOTAL SIGNATURES
12,078

asking the Obama Administration to acknowledge an extraterrestrial presence here on Earth. The U.S. government has no evidence that any life exists outside our planet, or that an extraterrestrial presence has contacted or engaged any member of the human race. In addition, there is no credible information to suggest that any evidence is being hidden from the public's eye" (see http://tinyurl.com/3qlh5g7).

As far as I can tell, this response is 100 percent correct and accurate. However, as you might imagine, it did not go down well with Bassett. PRG states simply, "The response was unacceptable." They wrote a rebuttal to the White House, urging reporters to review "quotes by persons of high rank and station over many decades" and the typical far-out pro-UFO claims (http://tinyurl.com/733umsj).

The White House's signature threshold for a petition response has since been raised to 25,000, although the change is not retroactive. However, Bassett was urging his followers to raise the signature count over 25,000 anyway as a demonstration of their strength. The final signature count was 12,078.

Stephen Basset has been very busy. He placed the "Disclosure II Petition" on the White House website on December 1 (http://wh.gov/jz0):

> We petition the Obama Administration to demand a full congressional investigation of UFO/ET Disclosure efforts by the Clinton OSTP [Office of Science and Technology Policy]—the Rockefeller Initiative.
>
> In response to the first Disclosure Petition, the OSTP stated, "The U.S. government has no evidence that any life exists outside our planet, or that an extraterrestrial presence has contacted or engaged any member of the human race.
>
> If true, what was the OSTP investigating from March 1993 to October 1996 in concert with billionaire and Clinton friend, Laurance Rockefeller?
>
> Those who knew of and have not spoken publicly of this initiative include: Bill Clinton, Sec. of State Hillary Clinton, Obama transition co-chair John Podesta, Sec. of Defense Leon Panetta, Dr. John Gibbons, Albert Gore and Governor Bill Richardson.

Note that the new disclosure petition involves "Hillary Clinton" and "Albert Gore," among others (http://tinyurl.com/PRGII). However, this time it needed 25,000 signatures by the end of December, which it did not get. It was a bizarre subject for a petition: requesting that the Obama administration demand a congressional investigation of the Clinton administration's "ET disclosure" efforts (see this column, SI, May/June 1997, and also my book *Psychic Vibrations*, p. 88), as if anyone outside of a few UFO zealots even remembers that minor footnote to UFO history. Bassett promises to submit yet another disclosure petition to the White House, but as of this writing he has not done so.

Basset is not the only one petitioning for disclosure. UFO author Richard Dolan and Hollywood producer Bryce Zabel have posted a petition to "Investigate Unidentified Aerial Phenomena [UAP] as Reported by Citizens, Police, Astronauts, Pilots and the Military" on the White House website (http://wh.gov/jeK). This petition, a better-crafted one in my judgment, calls on the U.S. government to "conduct an independent investigation. This inquiry must transparently review the key unsolved UAP reports with access to classified documents. It must have the power to call witnesses and grant immunity. The findings should be publicly presented." However, it drew even fewer signatures than Disclosure II.

To prevent confusion, I should note that nothing I've said above about "disclosure" has anything to do with the Disclosure Project founded by Steven Greer. It burst through the mass media like a brilliant meteor on the occasion of its Washington, DC, press conference on May 9, 2001, but because of the complete absurdity of its claims compounded by lack of tangible evidence, it faded from view nearly as fast and has never resurfaced ("Psychic Vibrations," SI, March/April 2002). The conservative UFOlogist John Alexander, in his book *UFOs Myths, Conspiracies, Realities* (see my review in this issue, p. 58), says that by 2001 a number of UFO activists, including Alexander working behind the scenes, were building support in Washington for a new round of Congressional hearings on UFOs. They believed their goal would soon be reached. Then along came Greer with his absurd, highly publicized claims, making sensational cover-up accusations against the government, and suddenly all possibility of government support for an investigation into UFOs was lost. Hence Alexander's observation that "the UFO movement is its own worst enemy."

In honor of all UFO Disclosure, past, present, and future, let me quote a few of the optimistic disclosure predictions of previous years:

• "Vatican UFO disclosure Soon," 2009, (www.youtube.com/watch?v=FWt_JS-H3TY).

• "It is my analysis that the ending of the official government's UFO cover-up began August 7, 1996. . . . We may expect further announcements related to UFOs and extraterrestrial life, after the November 5 election."—UFOlogist Richard Boylan (http://www.qtm.net/~geibdan/newsb/boylan.html).

• "Before the year is out, the Government perhaps the President—is expected to make what are described as 'unsettling disclosures' about UFOs."—U.S. *News & World Report*, April 18, 1977.

• "Aliens . . . will begin transmitting their secrets to us no later than August, 1977"—Jeane Dixon, 1976.

• "We predict that by 1975 the government will release definite proof that extraterrestrials are watching us."—Ralph and Judy Blum in *Beyond Earth: Man's Contact with UFOs* (1974).

• "The time is getting near when the U.S. Air Force will have to end its long-standing tactic of concealment."—Syndicated columnist Roscoe Drummond, 1974.

• "FLYING SAUCERS—THE REAL STORY: U.S. BUILT FIRST ONE IN 1942. Jet-propelled disks can outfly other planes. . . . By choosing which [jet] nozzles to turn on or off and the angle of tilt, the pilot could make the saucer rise or descend vertically, hover, or fly straight ahead, or make sharp turns . . . a big advance in the science of flying. . . . No official announcements are being made yet, but about the only big secret left is 'who makes them.' Evidence points to Navy experiments. . . ."—News "scoop" in *U.S. News & World Report*, April 7, 1950.

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New Life for Human (Therapeutic) Cloning? Whence Come the Eggs?

Physicians have long fantasized over the promises of regenerative medicine—the ability to replace a suffering patient's diseased or damaged body cells instead of her organs, for example. To that end, medical researchers continue to search for ways to procure stem cells with at least two critical attributes. First, they should be pluripotent, or capable of forming all three germ layers and any of the body's tissue types. Second, in order to avoid immune system rejection, they should be patient-specific, or derived from the ailing person's own genome.

In 2006, Shinya Yamanaka revolutionized the field with the development of induced pluripotent stem cells (iPSCs). He was the first to successfully reprogram adult fibroblasts to a pluripotent, embryonic-like state through the forced expression of four transcription factors (*SOX2*, *KLF4*, *MYC*, and *OCT4*). Shortly thereafter, staggering progress was made in differentiating human iPSCs into neurons and heart, liver, pancreas, and eye tissues.

In 2010, researchers from Ohio reported success in coaxing human iPSCs and separately cultured human embryonic stem cells (hESCs) to form a three-dimensional organ resembling an intestine. They were also able to recapitulate smooth muscle tissue, nutrient-absorbing cells, and mucous, hormone, and enzyme secreting cells. Others have used iPSCs to cure diabetes in mice. Many experts now claim that iPSCs are poised to have a major impact on disease modeling, drug screening, and cell-based therapies.

But iPSCs pose serious problems, too. First, inserting external genes into reprogrammed cells can cause any number of expression anomalies. Second, one of Yamanaka's transcription factors is known to cause tumors. Third, the reprogramming process can be very inefficient. Indeed, one recent study found that iPSCs were thousands of times less likely to proliferate and suffered greatly increased rates of early senescence (aging) and apoptosis (cell death) when compared to their embryonic counterparts.

The evidence also indicates that iPSCs tend to retain traits from their tissue of origin—residual DNA methylation signatures that could seriously compromise these cells' suitability for medical use. In one study describing the phenomenon of "epigenetic memory," researchers compared iPSCs reprogrammed through the Yamanaka method to embryonic stem cells (ESCs) generated via somatic cell nuclear transfer. They learned that iPSCs were less likely to achieve "ground state pluripotency" and, disappointingly, that they tended to differentiate into their original cell types.

Even so, scientists have addressed and, in exceptional cases, overcome some of these obstacles. Derrick Rossi used synthetic RNA molecules corresponding to the standard Yamanaka factors to produce RNA-induced pluripotent stem cells. His method was 100 times more efficient than its viral counterparts and took roughly half the time. Sheng Ding effectively reprogrammed human skin cells by treating them with drugs and only one virus-delivered gene. Never-

theless, no leading researcher believes that iPSCs can provide a solution to every challenge.

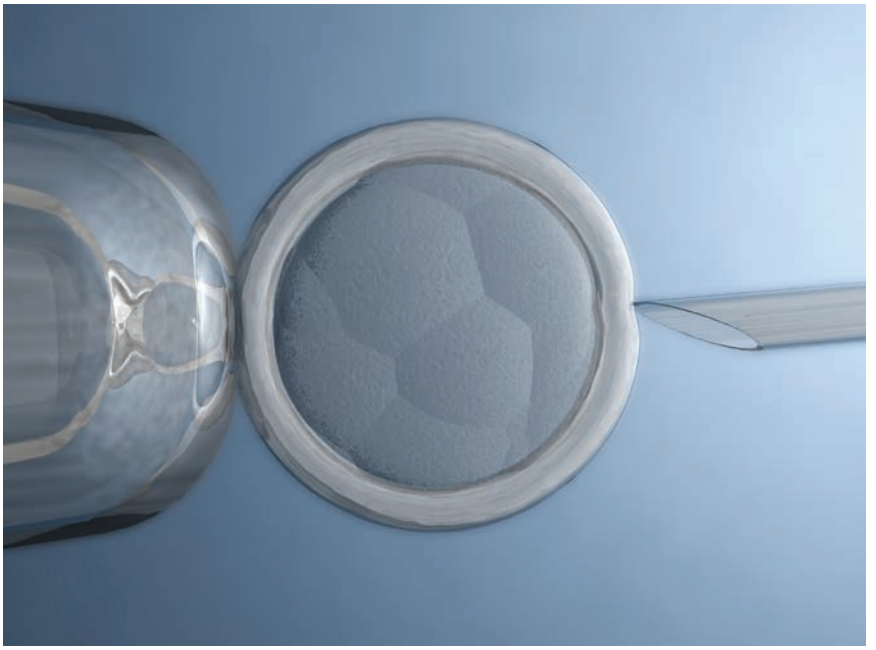
The epitome of pluripotency, of course, is represented by the embryonic stem cell. Unfortunately, these cells pose major problems too. First, the destruction of any embryo remains controversial for many religious enthusiasts. Second, fertilized embryos generally do not yield patient-specific stem cells.

But what if scientists could instead use human oocytes, or egg cells, to reprogram soma, or body cells, back to pluripotency? This "cloning" process, referred to in professional circles as somatic cell nuclear transfer (SCNT), has a checkered history. In 1996, Dolly the sheep proved that it was possible to clone an animal by transferring adult DNA into an oocyte. Since then, only a few experiments—involving mice and rhesus macaques, for example—have reportedly produced cloned ESC lines for research or tissue therapy. And despite a fraudulent report in 2004 from biologist Woo Suk Hwang, no human cell has ever been successfully cloned.

Nevertheless, George Q. Daley—stem cell guru at Harvard Medical School and Children's Hospital Boston—recently argued, "Although it is premature to conclude that . . . iPS cells pose insurmountable risks, comparative studies of mouse stem cells suggest that SCNT may be more effective" (Daley 2011).

Indeed, on October 6, the possibility of deriving pluripotent, patient-specific stem cells via SCNT came one colossal step closer to becoming reality. Scott Noggle and Dieter Egli from the New York Stem Cell Foundation Laboratory reported the reprogramming of human somatic cell genomes to a pluripotent state, thus demonstrating for the first time that human oocytes can transform differentiated soma—skin cells, in this case—into stem cells (Noggle et al. 2011).

Yet their triumph was incomplete. In order for researchers to derive stem cells, reconstructed eggs must be brought to the blastocyst, or seventy- to 100-cell, stage of development. This can occur only after about five days of development. To achieve that result, Noggle and Egli were forced to create cells that were abnormal and unfit for practical use.



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More than a decade of previous research involving primates and strict nuclear transfer—where the egg genome is removed, á là Dolly the sheep—had ended mostly in cell developmental arrest at about three days. Unsurprisingly, the results obtained by Noggle and Egli were consistent with that history.

Their study involved 270 mature, high-quality human oocytes from sixteen donors along with somatic cell genomes gathered from male adults, both diabetic and healthy. The latter were marked with a green fluorescent protein (GFP). In the end, genome exchange consistently led to developmental arrest and death without expression of the GFP.

But something exciting and largely unexpected happened as part of the team's control experiment. Therein, the somatic cell genomes were merely added, and the oocyte genomes were left in place. On the fourth day of development the embryos began to express the GFP, and Noggle and Egli were able to develop the reconstructed eggs to the blastocyst stage in thirteen out of sixty-four

attempts. From the inner cell masses of those blastocysts, they derived two pluripotent stem cell lines.

So what's the hitch? Two's company and three's a crowd, mostly. When the diploid genome of the somatic cell was added to the haploid genome of the oocyte, each of the resulting stem cells was rendered triploid, containing three copies of every chromosome instead of the familiar two. That made the stem cells abnormal, unstable, and thus currently irrelevant for medical purposes.

Nevertheless, in terms of continuing research, this discovery's value remains inestimable. One wonders, for example, whether Noggle and Egli's method can assist scientists in surmounting the aforementioned obstacles related to iPSCs. Importantly, the cells produced by Noggle and Egli displayed no evidence of epigenetic memory. Further investigation might well reveal transcription factors—thus far unidentified by Yamanaka or his successors—capable of enhancing or even perfecting the reprogramming process.

Perhaps the team's method can be adapted directly to therapeutic uses, to one day generate usable patient-specific blastocysts. In a nutshell, we now realize two things. First, if the oocyte's genome is removed too early it fails to provide a very special something capable of reprogramming the somatic cell nucleus. Second, if it is left in the embryo too long, it fuses with its genomic complement and cannot be extracted. Can researchers find a way to remove it at the last possible moment? Might the use of a different kind of somatic cell—from blood or neural tissue, for example—solve the problem?

Noggle and Egli are now convinced that somatic cell reprogramming using human eggs is feasible. "With a reliable source of human oocytes," they predict, "it should be possible to overcome the requirement of the oocyte genome for somatic cell reprogramming, allowing the generation of diploid pluripotent stem cells."

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That scientific possibility forces us to confront yet another set of predicaments, this time sociopolitical in nature. Many will find Noggle and Egli's results troubling for at least three reasons. First, continued research will result in the creation and destruction of embryos. Second, successful human SCNT might someday be employed to clone people. Third, and most significantly for researchers at this critical juncture, renewed enthusiasm for the process will likely produce increased demand for human oocytes.

The New York Stem Cell Foundation enjoyed abundant access to oocytes because it collaborated with a Columbia University program that paid $8,000 to each eligible woman who expressed an interest in donation for research. The Empire State has allowed compensation for that purpose since 2009. The rules vary from state to state, however. Such payment is banned in Massachusetts, for example, and guidelines recently issued by the U.S. National Academy of Sciences allow no more than reimbursement for expenses like travel and lost wages.

In the United Kingdom, direct payment is also prohibited. Instead, pursuant to an "egg sharing" program, women who donate voluntarily are given a discount on the cost of *in vitro* fertilization treatments. A new report compiled by the Nuffield Council on Bioethics, however, recommends reasonable payment balanced by ethical oversight and a registry designed to limit repeated donation.

Such bans and regulations are purportedly intended to prevent women from feeling unduly coerced. But, as Noggle and Egli observe, "very few women agree to donate their oocytes for research without payment." One might judge such oversight to be unnecessary, of course, or even paternalistic. Indeed, each of the team's sixteen donors was gainfully employed.

Jan Helge Solbakk, medical ethicist at the University of Oslo, heartily applauds the team's decision to not only pay their donors but acknowledge them as study participants as well (Sobakk 2011). Such recognition, he contends, focuses attention on the women instead of on the oocytes, avoids reducing the latter to mere commodities to be sold on the open market, and recognizes the donors' contributions as valuable services for which they should be modestly paid.

Noggle and Egli's novel approach to this sensitive issue, Solbakk reverently concludes, "represents the first step towards acknowledging women as genuine participants—coproducers even—in the generation of new knowledge." What could be more laudable than that?

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[SKEPTICAL INQUIREE BENJAMIN RADFORD

Benjamin Radford is a research fellow at the Committee for Skeptical Inquiry and author or coauthor of six books, including *Tracking the Chupacabra: The Vampire Beast in Fact, Fiction, and Folklore.*

Do Einstein's Laws Endorse Ghosts?

Q: Einstein's conservation of energy law in physics states that energy is neither created nor destroyed but merely changes form or moves from one place to another. Where does the energy from our life forms go after we die?

—D. Oakes

A: In my years of investigating ghosts, I've occasionally encountered the idea that the laws of physics somehow support the idea of ghosts. From my basic knowledge of physics the claim seemed absurd, but I was shocked to see how widespread it is. An October 2011 Google search turned up nearly eight million hits suggesting a link between ghosts and Einstein's conservation of energy law.

Indeed, once I started looking for references to this peculiar little claim, I found them everywhere. Some version of this assertion is repeated on hundreds of ghost-hunting websites by top "experts" in the field (see, for example, Belanger 2003 and Greater Maryland Paranormal Society 2011).

One book, *Hoosier Hauntings*, offers the following theory of the origin of ghosts based on "known and proven chemical and electrical principles": "The physical act of living ... generates and radiates electrochemical, or, perhaps, electromagnetic radiation [that] is very strong and takes centuries to dissipate" (MacRorie 1997). Thus ghosts are said to be electrochemical or electromagnetic radiation remaining from the dead.

John Kachuba, in his book *Ghosthunters*, writes, "Einstein proved that all the energy of the universe is constant and that it can neither be created nor destroyed. . . . So what happens to that energy when we die? If it cannot be destroyed, it must then, according to Dr. Einstein, be transformed into another form of energy. What is that new energy? . . . Could we call that new creation a ghost?" Kachuba goes on to confuse the physics-based energy that Einstein described with some sort of emotional or spiritual "energy" unknown to science: "What of the energy that composes our spirit, our spiritual essence? What happens to that?" (Kachuba 2007).

The website for a ghost-hunting group called Tri County Paranormal (members claim to "employ a completely scientific approach" to ghosts) asks, "When we are alive, we have electrical energy in our bodies.... What happens to the electricity that was in our body, causing our heart to beat and making our breathing possible? There is no easy answer to that" (Tri County Paranormal 2010).

In fact the answer is very simple: The human body's energy, after it dies, goes where all organisms' energy goes after death: into the environment. When we eat dead plants and animals, we are consuming their energy and converting it for our own use. Food is metabolized when digested, and then chemical reactions release the energy the animal needs to live, move, reproduce, and so forth. That energy does not exist in the form of a glowing, ghostly ball of electromagnetic energy but instead in the form of heat and chemical energy.

When we die, the energy stored in our bodies is released in the form of heat and transferred into the animals that eat us (i.e., wild animals if we are left unburied or worms and bacteria if we are interred) and the plants that absorb us. If we are cremated, the energy in our bodies is released in the form of heat and light. The fuel you use to fill your gas tank is made from the stored energy of plant and animal matter that died many millennia ago; the energy moved from one form to another without generating any intermediate paranormal or ghostly entities.

Humans and other organisms generate low-level electrical currents that stop being generated when the organism dies. Because the source of the energy stops, the electrical current stops—just as a light bulb turns off when you cut off its energy source.

This is a perfect example of why skeptical investigation and critical thinking are needed to examine the validity of your assumptions. The "energy" that any dead person leaves behind is not in a form that can be detected with the ever-popular ghost-hunting electromagnetic field detectors. Ghost hunters and supposed experts who repeat this claim reveal nothing about ghosts—but much about their ignorance of basic science.

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Skepticism One Wikipage at a Time

Talking with Wikiskeptic Susan Gerbic-Forsyth

If you've ever searched Wikipedia for skeptical topics or looked there for topics covered by organized skepticism, chances are you've probably read some of **Susan Gerbic-Forsyth**'s work. She's a very active member of the Center for Inquiry–Los Angeles and the Independent Investigations Group (IIG). She's also one of the driving forces behind trying to bring skepticism, balance, and critical thinking to the world's most-used reference source. She responded to SI Deputy Editor **Benjamin Radford**'s emailed questions from a secret bunker somewhere in Southern California.

What's your background?

Having been raised Southern Baptist, I never heard the word *atheist* until I was in my late teens. Once I found out there were other people who felt the way I did, I read everything I could on the subject. I discovered skepticism as a community in 2000 while looking for a topic for a college paper; I attended a small gathering in San Jose, California, where I met Carol and Ben Baumgartner, Wallace Sampson, and Jere Lipps and was hooked. Then I went to the Skeptic's Toolbox in Eugene, Oregon, that August and felt like I had found my people. I'm officially a skeptical junkie—just waiting for the paperwork to prove it.

I'm the cofounder of Monterey County Skeptics, which is a social group of fifteen to thirty people who hang out together. Being in the LA area so much, Mark and I both got involved with the IIG. That has become an awesome outlet for my high-energy personality; I'm a "doer" and the IIG is a "doing things" group, so we fit together nicely.

Do you think Wikipedia is really one of the main battlegrounds for skepticism?

Yes I do, and I think I can prove it with numbers—skeptics like numbers. Podcasts, lectures, blogs, etc., are all wonderful and needed because they build a stronger skeptical community. They also introduce us to more and more outlets that we can explore. But with a few exceptions, we are still preaching to the choir.

We still have to have investigations and video media to release to the public. It is like an ecosystem with all the different parts working together.

Wikipedia is where it all comes together. We know how many people are accessing Wikipedia pages; we can compare those numbers to the number of hits an article on the same topic is generating when it comes from a personal website or blog. The numbers are staggering and varied, but generally Wiki hits outnumber articles every time. See Tim Farley's blog for more information on this (http://skeptools.wordpress.com/2011/07/22/why-skeptics-wikipedia-traffic/).

Look, we also know that people rarely change their minds when someone is yelling at them and telling them how stupid they are. Most of us skeptics have been believers on some level and we should know better. What people need is reasoned discussion and the ability to do their own research. They are going to go to a neutral site to do so, and Wikipedia is waiting for them. When they have looked over the page and explored all the pages linked, they are better able to change their minds.

How is Wikipedia structured and administered?

All of the site's volunteers are working towards creating a living, breathing encyclopedia—that's pretty awesome, I think. They have their own rules and language that take time getting used to. I'm totally self taught; I've tried reading the instructions on how to edit, but it's like reading a tech manual. I ask people for help and look at well-authored pages, copy what I like, and paste into the page I'm editing. I change the page to reflect the person/topic I'm working on, and I'm done.

How is the Wikipedia content judged?

It's mainly peer-reviewed. Some editors are considered higher-level than others, but for the most part I've had little problem with the edits that have been reverted. You can't take it personally; we are creating a better encyclopedia, which must be the main goal. If you are having problems with an editor then step back and try to see what is really the problem—usually you can work through it. There is a process for peer arbitration with which I've threatened someone but never used. Once you get a bunch of edits under your belt you can start editing with confidence. Be bold, cite everything, and usually people will leave you alone.

What have been some of the main challenges to injecting skepticism into Wikipedia?

Probably only time. There is so much to be done; people are always telling me "Good job!," which is nice to hear, but what I badly need is help editing. Kudos are nice, but help is better. The project is that important. The tips and ideas I give on my blog *Guerrilla Skepticism* range from copy/paste/save types of edits and fixing grammar to rewording blurbs and more advanced items.

Obviously some skeptical content will upset people,

such as psychics who rely on the general public not knowing about their track records of failure. What sort of opposition have you seen? Can you give a few examples?

I have had almost no contact with anyone upset about any of my edits. I do see some frustrated comments people have left in the discussion area of pages—almost all from believers upset that their favorite psychic's page is not balanced. Wikipedia is not balanced; you will never see a citation about the earth being flat on the "Earth" Wiki page, nor will you see anything about a moon landing hoax on NASA's page. You'll just see cited fact after cited fact.

[Convicted felon] Sylvia Browne's page is a great example that I discuss on my blog. Believers do not always understand that you can't post opinions and stories; it has to be cited and neutral. Over and over people complain that there isn't anything about how Browne "helps people" and is "a wonderful person." They say that the only thing that the editors ever show is Browne's failures. I love it when I read the editors' responses that if they will find her successes in print (not her book) and they can be substantiated, then they will gladly post them on her Wikipedia page. Usually we never hear from that believer again. One man said he would find the evidence; it would mean long months in the library, but he insisted he would eventually find proof for us. We are still waiting. The exchange can be read on Sylvia's discussion page. It's great reading, by the way.

I have never suspected that any of the psychics have commented or edited their own pages. It's a losing battle; they have to show proof of their claims, and that isn't likely to hold up to review. Personally, I think they would rather the believers not go to Wikipedia to see what is there. I'm sure they downplay the site if it is mentioned.

Many people use Wikipedia but don't feel tech-savvy enough to become editors or contributors. What is the actual process to edit pages? Can you give a short introduction to show people the basics?

Start by opening a Wikipedia account. Read my blog for ideas and tips, or go to some pages and click around. In time you will get comfortable finding misspelled words and bad grammar. You fix things by clicking on the "Edit" page. Make simple changes and at the bottom of the Edit page you will see the tabs for "Preview Page," "Save," "Watch This Page," and an area to comment. First, preview your change; if it looks okay then write in the comment area what you just did: "corrected spelling" or "added a period," etc. Click "Watch This Page" so that you will be notified on your "watch list" if there is a new change made to the page. When you are sure you have done all of this correctly, click "Save."

You will know when you are ready to try more difficult changes. I learned to go to a well-written page, click "Edit," and copy the area that I know I want to duplicate elsewhere. If you want to write a blurb about a SKEPTICAL INQUIRER article you just read, start by opening a Word document somewhere so you can just play with the text a bit. Write two or three sentences you think will neutrally reflect the article. Copy a <ref> citation from some other page that you know was done correctly, and paste that into the Word document you are using. Change the citation that you know does not apply to your new citation—for example, the date the article was published and the name of the article will need to be changed in the new edit. Once you are completely happy with the blurb and reference, paste it into the Wiki page and follow the directions in the paragraph above.

I would love to mentor anyone interested in learning how to edit. One woman I met at TAM9 showed me how to "share my desktop" over Skype. If anyone wants to watch me edit and learn that way, please contact me. My Skype name is sgerbic.

Susan Gerbic-Forsyth is a Wikiskeptic.

Legend of the Ztarr

THE SKEPTIC EPIC

Entertainment—whether in the form of books, television, film, music, or graphic novels—can be a powerful way to convey a message, including the promotion of science-based thinking.

SARA E. MAYHEW

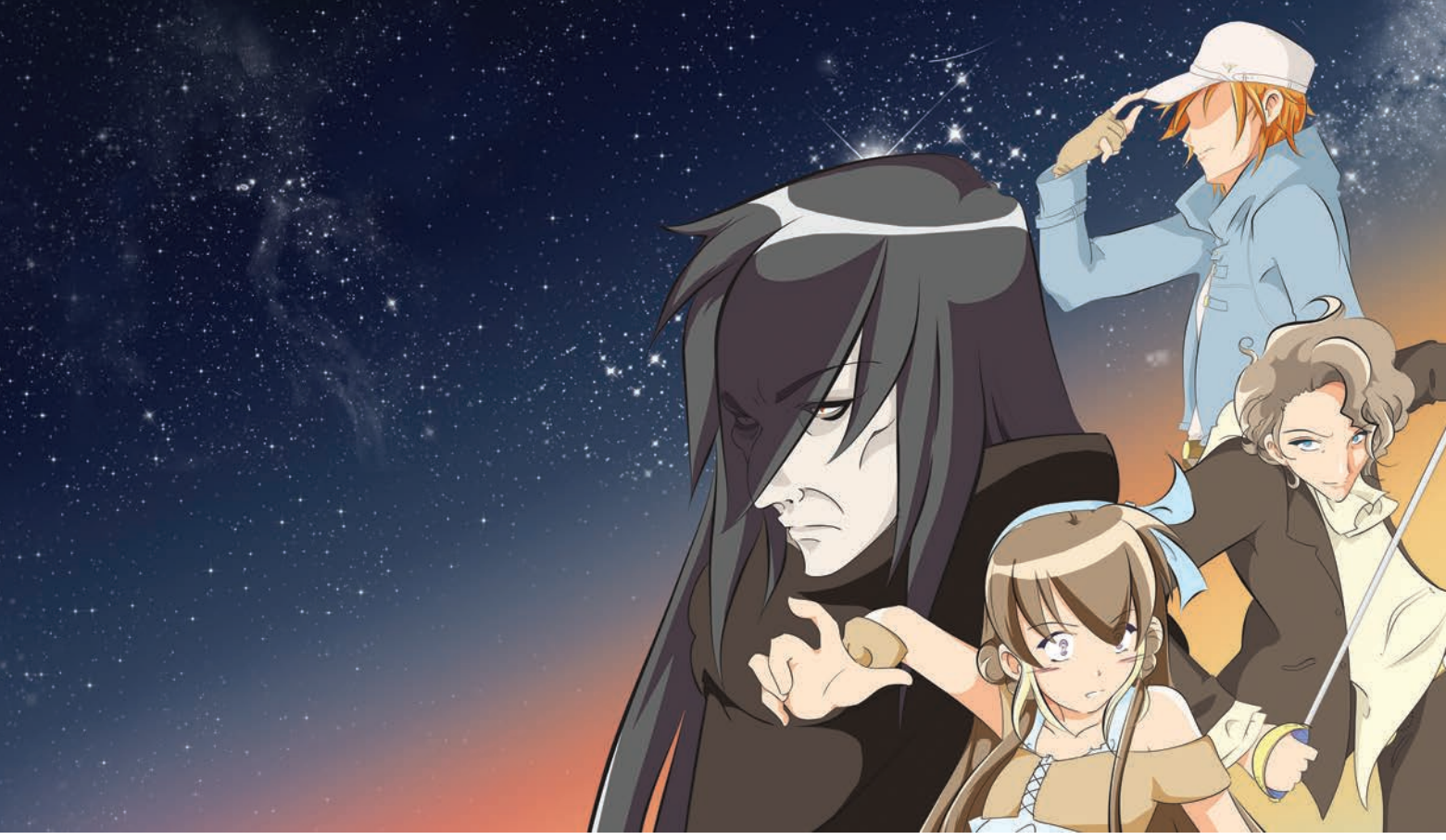
In 2009, I was invited to attend the prestigious annual idea conference TED (Technology Entertainment Design) as a TED Fellow; the conference's new fellowship program offers all-expenses-paid attendance for forty young world-changing individuals from across the globe. TED's slogan is "ideas worth spreading," and this is what they're looking for in their speakers—as content producer Kelly Stoetzel describes, "We look for someone who will say, 'Here's what we can do to make things better.'"

One thing I love to point out about the TED community is how well skeptics and science educators are represented at the events. TEDTalks speakers include James Randi, Michael Shermer, Sam Harris, Carolyn Porco, Dan Dennett, Richard Dawkins, Michael Specter, Brian Cox, and Phil Plait. I spoke on the TED Fellows stage at TED '09 and the TED You stage at TED Active '10.

My feeling is that the TED community and the skeptical movement have a common goal—making the world a better place—but the key to reaching it lies in the tools of skepticism. An essential part of finding ideas that improve human wellbeing is the ability to know what ideas are wrong. This is the strength of critical inquiry. It forces us to see the flaws in our own cognition so that we may attain a more accurate view of reality. Without skepticism, we are at the mercy of the biases of our fallible minds.

But skepticism can be a difficult idea to promote. Our tendency to default to belief and intuition make magical thinking an easy sell. Mysticism is quick to find superstitions to fill the uncomfortable gaps in our knowledge; it's an easy fix. Herein lies the difficulty—not in ignorance but in misinformation. Missing facts are easy enough to remedy through education, but once a belief has settled into our minds it's difficult to remove. In fact, a misinformed individual will typically become more confident in his or her belief when presented with disconfirming information. So what do we, as proponents of critical thinking, do in the face of this disheartening reality?

Here is where my work as a writer and artist crosses over with promoting science-based thinking. Entertainment—whether in the form of books, television, film, music, or graphic novels—can be a powerful way to convey a message. One of the most important things to accomplish in entertainment and storytelling is to connect with your audience emotionally. An interesting plot just isn't quite as good unless you feel emotionally invested in the characters. A technically proficient piece of music or artwork that doesn't provoke an emotional reaction doesn't really stand a chance against a piece that does, even if that piece isn't as technically sound. The intellectual arguments in science and skepticism are often far superior to those made in belief-based schools of thought. Adding the



strength of a good emotional argument may be a strategy that can help promote science-based thinking by getting people emotionally invested in the idea.

One of my favorite examples of the power of storytelling is the 2010 film *Inception*. Not only is it quite a good example of successful storytelling, but the plot itself is analogous to how good stories are told. The plot involves the main character, Cobb (Leonardo DiCaprio), hired to place (by entering a fabricated dream-world) the idea into the mind of Robert Fischer (Cillian Murphy) to break up his father's company. The movie can be interpreted as symbolic of how movies are created. The idea to be incepted represents the message a film is trying to convey; Cobb's character represents the director, whose job is to execute that successfully using a crew, cast, and setting. The other characters represent the cast and crew: Arthur (Joseph Gordon-Levitt), "The Point Man," is the producer responsible for overseeing the details of the job. Ariadne (Ellen Page), "The Architect," creates the settings for the dreams and can be viewed as the script writer. Eames (Tom Hardy) is "The Forger," who can transform himself into different characters, like an actor; and Yusuf (Dileep Rao) represents the crew as "The Chemist" who does the practical job of getting the others into the dream-world. Saito (Ken Watanabe), who hired Cobb and his team, is the money behind the job, just like a movie studio. "The Mark" is Fischer, who must be convinced of the reality of the dream and implanted with the desired idea—representative of the audience of a film.

The characters set out to accomplish their job of incepting Fischer by boiling down the message to a very basic concept and then constructing a reality that will make him emotionally invested in that concept, manipulating him into thinking that he came to the idea himself. This is very similar to what actual storytelling does using characters, settings, and plot to guide the audience through a constructed reality with the goal of implanting a message in its members' heads. Just like the dream worlds of *Inception*, stories feel real while you're in them, and you leave with the seed of an idea growing in your mind that has been planted by the emotional impact of the world you experienced. Articles, lectures, and documentaries are

LEONARDO DICAPRIO
YOUR MIND IS THE SCENE OF THE CRIME
INCEPTION
FROM THE DIRECTOR OF THE DARK KNIGHT
EXPERIENCE IT SUMMER 2010 IN IMAX

great mediums for communicating ideas (and do involve a certain amount of creating an emotional impact), but there's something very powerful and lasting about the effects fiction can have when executed successfully.

Science fiction, of course, has been a genre hugely successful at promoting science and skepticism through fiction. I'd like to argue that it doesn't have to

be the only genre we can turn to when looking to promote critical thinking through storytelling. One of my favorite counterintuitive examples of another genre promoting skepticism is the immensely popular fantasy series *Harry Potter*. For a story about a boy wizard who attends a school of witchcraft and wizardry, it contains a lot of content that promotes the ideas of both skepticism and secular humanism. The magic, witches, wizards, and mythological creatures are all simply part of an attractive setting; the actual plot does nothing to really promote the belief in the existence of the fantasy content.

The most skeptical of the trio of main characters is, without a doubt, Hermione. She is the problem solver in the group, always relying on her book smarts to get the group out of trouble; on numerous occasions it's pointed out how lost the other main characters, Harry and Ron, would be without her. The characters are taught to think for themselves and to be cautious of their own assumptions or biases. For a story about magic, it certainly makes a point to demonstrate that there are more important abilities one can have. Near the end of the first book, as Harry and Hermione find themselves in one of the barriers placed between them and the philosopher's stone, Hermione remarks how clever it is that one of them is simply a puzzle in logic.

> "Brilliant," said Hermione. "This isn't magic—it's logic—a puzzle. A lot of the greatest wizards haven't got an ounce of logic, they'd be stuck in here forever."

One of the main points of conflict in the Harry Potter series carries a strong secular humanist message. The antagonists are wizards who place value on so-called "pure bloods"—wizards who were born into magical families—over the "Muggle born," wizards who come from non-magical families but are born with magical abilities. One of the main goals of the villains is to see the pure blood wizards gain their "rightful" status above other wizards as well as the non-magical humans (*Muggle*s). The heroes of the story fight to stand up for the ideal that all humans deserve equal rights and that no class of people deserves to rule over another based on bloodline.

I'd like to note that many people have mentioned to me, after hearing one of my talks, a fan fiction called "Harry Potter and the Methods of Rationality," which involves an alternate storyline in which Harry is brought up by a scientist and uses critical thinking to investigate the magical world. I've heard great things about the story, but it misses the point of why I bring up the example of Harry Potter in the first place. The Harry Potter series is an example of using the fantasy genre—a world with magic and mythos—to promote critical thinking. The whole point is that it does this without having to inject any science fiction into the plot.

Leonardo DiCaprio's character acts as a "director" in 2010's *Inception*, the plot of which is analogous to how good stories are told.

The Harry Potter series is an example of using the fantasy genre—a world with magic and mythos—to promote critical thinking. The whole point is that it does this without having to inject any science fiction into the plot.

What I find so intriguing about this concept is that it exposes audiences and readers to nonscientist heroes who are critical thinkers, demonstrating that logic and reason are for everyone. It's always great to see scientists as lead characters (such as Jodie Foster's role as Ellie Arroway in the film *Contact*, based on the novel by Carl Sagan), but too often the heroes we're presented with are nonscientists who simply use a token nerd character when a scientific solution is needed. I'd like to see more storytelling with characters of all types using critical thinking to solve the conflicts with which they are presented.

This is an important focus of my own work as a mangaka—a writer and illustrator of manga graphic novels. Manga is a type of comic book that originated in Japan and was made popular by its animated counterpart, anime. My latest series is Legend of the Ztarr (pronounced "star"), a swords-and-sandals space epic following the adventures of a young woman named Adora Ztarr. Our young protagonist is the daughter of a legendary rebel who died attempting to overthrow the oppressive Emperor of the Known Universe, Lord J'Nar. The story begins with Adora being recruited by her father's still-loyal followers to fulfill the prophecy of the family sword: "The Sword of Ztarr, but once, shall slay and end The Holy Emperor's reign."

A key aspect of Adora's character is that she uses her skeptical mindset to solve the problems with which she's presented. Her power comes from her critical thinking abilities rather than just her swordsmanship and fighting skills. This is in contrast to the character of the evil Emperor and his loyal group of true believers, who concern themselves only with protecting their ideologies and preconceptions. But the antagonists aren't the only characters who hold tightly to deeply held beliefs; our heroine makes her journey with a band of guardians who have their own variety of irrational ideas. Adora is left contending with the friction this causes as they attempt to work together against Lord J'Nar.

The goal is to create a series that serves as a skeptical epic with a sci-fantasy feel—swords, emperors, prophecies, star ships, and powerful mysterious objects—that can connect readers to the values of critical thinking using emotional rather than logical arguments. The advantage to using storytelling to promote a message is that it is primarily entertainment. Arguments that might otherwise be challenging to get across can travel more subtly on the backs of the drama, humor, and romance of narrative. Magic and mysticism, already seductive through their emotional appeal, sell themselves easily this way and have made themselves pervasive in entertainment. The power of storytelling can instead be harnessed to open people to a world devoted to the idea of distinguishing between what is true and what we simply *want* to be true, of avoiding self-deception and empowering ourselves with the tools of critical inquiry. This is an idea worth spreading. ■

Sara E. Mayhew is a writer and illustrator of manga graphic novels, a type of comic book that originated in Japan and was made popular by its animated counterpart, anime. She has been a TED Fellow and has won praise for her values of promoting science literacy and skeptical thinking through art. She has done many public appearances, including at the Center for Inquiry–Los Angeles. Her website is saramayhew.com.

Amateur Paranormal Research and Investigation Groups Doing 'Sciencey' Things

A study of 1,000 websites shows how amateur groups use technical jargon and equipment as symbols of what is "scientific" while actually promoting the paranormal and not adhering to any real scientific principles of investigation.

SHARON HILL

In the early 2000s, a new kind of paranormal-themed show appeared on television. This "reality-based" genre of programs featured individuals or teams of nonscientists who undertook investigations of alleged paranormal phenomena. The Syfy network's *Ghost Hunters*, the most popular of these shows in the United States, boasts over two million viewers per episode (Seidman 2009) and has launched two spinoff shows. The show's group, The Atlantic Paranormal Society (TAPS), directly influenced the formation of other similar groups (Brown 2008). Within a few years, multiple cable television networks hosted shows that portrayed people directing and participating in self-styled investigations into UFOs, monster reports, and strange, spooky activity around the world.

Also in the first decade of the twenty-first century, amateur research and investigation groups (ARIGs) sprang up in communities across the United States. Many represented their activities as scientific. Interested in seeing how ARIG ideas about being scientific compared to those of the scientific community, I conducted a review of 1,000 websites representing ARIGs in the United States (Hill 2010). How many are there and in what manner do these groups use science to promote themselves and fulfill their mission?

Defining ARIGs

ARIGs are unique in that they examine areas on which no organized academic research or inquiry is focused—perceived paranormal events. They are led by and composed of people who have little or no scientific training. In these two ways, they significantly differ from other amateur science programs for which nonscientists gather specific material data for established science-based research programs.[1] ARIGs are typically hobbyist groups held together by their interest in the subject. Members are serious about their research activities, but jobs limit their participation. Involvement in these groups is an example of a "serious leisure" activity (Stebbins 1992): like-minded individuals diligently pursue an activity to fulfill certain social and personal aspects of their lives.

I limited my study to groups who use the Internet. The Internet provides an efficient way for ARIGs to recruit new members, exchange information, and solicit cases from the public to investigate. ARIG websites reveal their mission, goals, methods, philosophy, and typical results. While these groups are also marketed through local word of mouth or media appearances, a web presence often provides the first point of contact for those who may be seeking help to explain a suspected paranormal experience.

Considering the above observations, I define ARIGs by the following characteristics:

1) Not under the auspices of an academic institution or headed by working scientists
2) Focused on investigation of unexplained or paranormal events such as reports of hauntings, mystery animals, unidentified aerial objects, natural anomalies, and parapsychological phenomena
3) Undertaking activities that do not provide a primary form of income for participants
4) Self-forming and independent (but may hold affiliation with a larger organization)
5) Promoted via the Internet

Characterizing ARIGs in the United States

Prior to my research, word of mouth in the paranormal and skeptical communities suggested that there were hundreds, if not thousands, of ghost hunter, UFO seeker, and monster tracker groups across the country, but no one had attempted to formally count them all. Counting these groups is difficult because they are ephemeral—as easy to let die as to set up.

Before social networking tools, it was difficult to connect with others who were interested in fringe topics. Such groups historically recruited via

bulletin boards and advertisements; they were maintained through mailed newsletters, desktop journals, and physical gatherings. The Internet lowered the barriers to group formation.

I collected 1,600 ARIG web addresses through various Internet search methods and index sites. At this point, I realized there were many more I had yet to count. I accepted that 1,600 would serve as representative of the population, and the list was randomized and numbered. Information was then collected on the first 1,000 active sites. Data collected included the group name, home state, subject category, and scientificity (whether or not they claimed to use science or scientific methods), as well as several features observed that were common (use of psychics) or unique (specialized in cases with children or animals, for example).

My results showed that almost all U.S. states had four or more groups active at the time of the survey. There was at least one group in every state, with the overall numbers roughly correlated to population density across the United States. Ohio and Pennsylvania had the highest tallies at eighty-one and eighty, respectively. Because many groups will travel to adjoining states, there are overlapping "coverage" areas among ARIGs.

ARIG subject areas resolved into four categories: ghosts, cryptozoology, UFOs, and general paranormal (including natural anomaly occurrences or cases of alleged psi phenomena). Values are shown in Figure 1. Many groups stated they would investigate all categories and were labeled "paranormal." Out of 1,000 groups, 879 identified with the category of "ghosts." An additional eighty-one included ghosts within the broad "paranormal" category. These counts affirm that ghost hunting is *incredibly* popular and trendy.

Only five specialized in UFOs or UFOs in combination with other anomalous phenomena (but not ghosts). One of the five is the Mutual UFO Network (MUFON), which claims thousands of members with a director plus investigators in every state. (Several states are combined under "New England.") Over the past few decades, UFO research consolidated under MUFON, which provided unified methods of investigation, training, state-to-state cooperation, and sharing of results.

In contrast to the UFO research centralization, the ghost groups are smaller, diffuse, and independent. There are a few preeminent groups with which individual groups can be affiliated, such as TAPS or Ghost Adventures Crew (GAC)[2]; however, they do not direct group functions but rather only provide a set of standards to which groups must adhere to maintain affiliation.

Thirty-five groups specialize in cryptozoology, mostly focusing on Bigfoot reports. Cryptozoology groups may be local or have members dispersed across the country. There is no overarching organization.

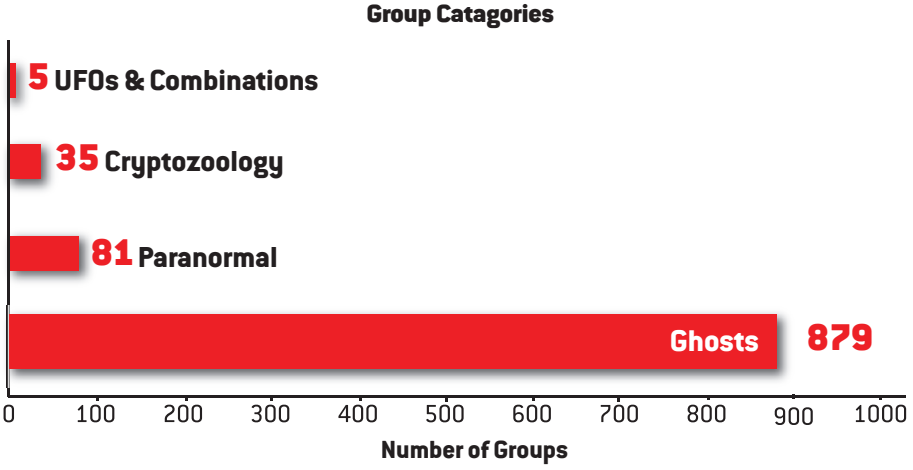
I used the Internet browser's search feature on each site's main page to locate the text string "scien" returning results for "science" and "scientific," if it existed, on the page. Use and context of these terms determined the group's "scientificity." If the use of these words was not positive (i.e., was anti-science), then the scientificity was counted as "no." If positive or neutral, the scientificity was "yes." If the terms were not used at all, scientificity was labeled "not specified."

A total of 526 ARIG websites (52.6 percent) displayed scientificity by explicitly using "science" or "scientific" in reference to their mission, methods, or goals. An additional twenty-seven sites used "scientific" to refer to their equipment only. Twenty designated their group as "semi-" or "quasi-" scientific or strongly suggested science by use of oblique references such as "not an exact science." Only nineteen ARIGs were completely nonscientific or anti-science, advocating a completely psychical or subjective approach. The remaining 40.8 percent of sites did not specify. (See Figure 2.)

ARIGs' 'Scientific' Methodology

Indicator surveys consistently show that "science" is held in high regard in our society (National Science Foundation 2009). Every party with a claim wants science to support its side. This, I suspect, is a main reason why the majority of ARIGs attempt to cultivate a serious, science-like image. Manner, language, and procedure of science are imitated in order to appear sophisticated and credible (Degele 2005; Haack 2007).

Two primary means ARIGs use to portray a scientific image are *jargon* and *use of technology*. Use of science jargon, or "scientese" (Haard et al. 2004), was common to ARIGs that exhibited scientificity. Several sites have specific sections pertaining to the "science" of their activities. Commonly used terms include words such as *frequency*, *resonance*, *energy*, *quantum*, *magnetic*, *environmental*, and *electricity*. Yet the sites lack operational (or even common) definitions for these terms. Vague and confusing language is ubiquitous: ghosts "use energy," are made up of "magnetic fields," or are associated with a "quantum state." Scholarly references to scientific works are nonexistent, but Einstein and Edison are frequently and explicitly connected to current ideas about communication with paranormal entities as if credibility can be bolstered by naming people popularly associated



In stark contrast to scientific writing, (amateur investigation group) websites will frequently state certainty in their goals or conclusions. Their mission is to "prove" a phenomenon they believe exists or to provide "irrefutable" evidence of same.

with science and technology.

The word *scientific* is also used liberally. Certain groups will proclaim their "scientific methods" citing a "scientific approach" and "scientific research" to obtain a "scientific solution" with "scientific proof."

ARIGs that claimed to use "a scientific method" equated the process most often with a systematic protocol of observation and collection of empirical data. ARIG methodology, as outlined on their websites, includes the following: eyewitness interviews, site visit(s) with equipment setup, collection of data in usually one but possibly multiple days and/or nights, analysis of the data, presentation of the results to the client (if there is one), and a write-up or record of the investigation.

For ghost investigations, "scientific" collection of data consists of gathering temperature readings, electromagnetic field anomalies, photographs, sound recordings, and other "energy" readings. This process often includes highly subjective methods such as psychics, dowsing rods, and Ouija boards to help guide investigators in equipment setup. The most common evidence cited by ARIGs for hauntings was electronic voice phenomena (EVP), where indistinct sounds recorded during the investigation are presumed to be communication with entities. I was hard pressed to find *any* data tables, graphs, maps, or documentation of the results, which one would expect to find in a typical scientific report.

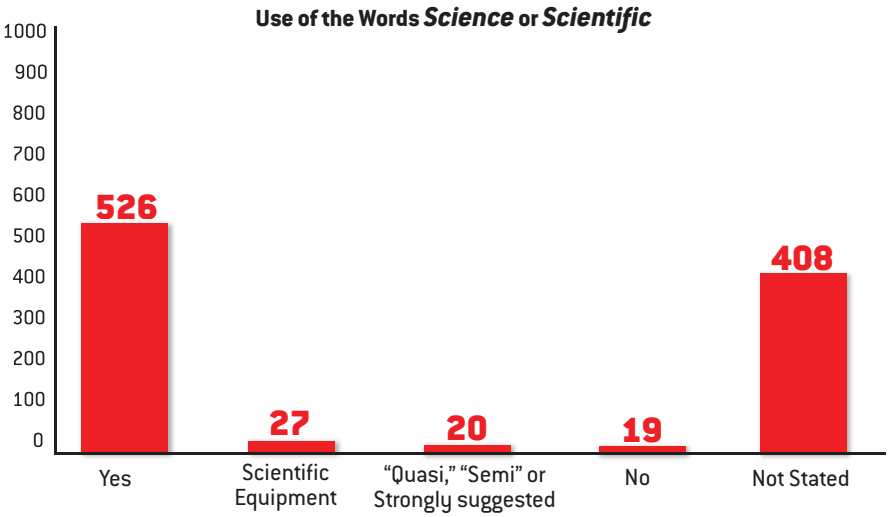
To establish a body of knowledge as "scientific" and to maintain science as a unique and respected endeavor, the scientific community subscribes to an ethos defined by ideals or norms (Ziman 2000). Merton (1942) established these norms as communalism, universalism, disinterestedness, and organized skepticism.

The first of Merton's norms, communalism, encompasses sharing knowledge and data, allowing others to reproduce the work. While ARIGs post their investigation reports online; these reports do not at all resemble scientific reports. Typically, they are not detailed enough for others to duplicate the process, are unreferenced, do not build on the work of others or any established scientific knowledge, and are not valuable beyond perhaps being a record of the investigators' impressions on that occasion. Many investigation results are confidential on the request of the client, therefore no findings are released.

The use of psychics or sensitives violates Merton's norm of universalism since only certain gifted individuals can "sense" the sprit present or communicate with the entity. The nongifted cannot confirm or deny such an observation. In haunting cases, the investigator is encouraged to be his or her own instrument, recording psychic or sensory impressions. This constitutes a full-on invitation to engage in biased, subjective, and unverifiable reporting.

The most egregious error made by ARIGs is their bias, which not only violates the norm of disinterestedness but also negates the entire investigation and its conclusions. While claiming open-mindedness, ARIGs are composed of those who hold a preconceived view of a phenomenon and set out to support it (Potts 2004). In stark contrast to scientific writing, ARIG websites will frequently state certainty in their goals or conclusions. Their mission is to "prove" a phenomenon they believe exists or to provide "irrefutable" evidence of same. Even more pretentious are those who wish to "adapt existing scientific laws to reports of the paranormal" or create a "bridge between the science and the paranormal." That language is a signal of how far removed ARIG participants really are from the established scientific community.

Skepticism is often given token lip service. Several ARIGs say they welcome skeptics. However, what open-minded skepticism *really* means to them is that one is open to the paranormal conclusion as the correct conclusion. The ARIG explanation too frequently defaults to the paranormal after an incomplete examination of alternative natural causes (Baker and Nickell 1992, 101–105; Radford 2010, 11–32). They express resentment of the scien-



tific community for not seeing what they, as paranormalists, view as obvious—that their evidence is convincing. While there are some explicitly nonparanormalist (skeptical) investigation groups, they are few.

ARIGs overwhelmingly display neither understanding of nor adherence to scientific norms. Another dramatic contrast to conventional scientific attitudes is the number of ghost investigation groups that are Christian-based, openly declaring their belief in angels, life after death, and demon infestations *directly alongside* their descriptions for collecting empirical data.

Equipment

Use of technology is pervasive for ARIGs. It is *de rigueur* to include a page on the website dedicated to equipment used. High-end, expensive, or unique instruments seem to be considered status symbols, with some groups advertising the largest or newest array of devices.

Ghost hunter groups rely on their equipment to record spiritual evidence. Several groups express the notion that new technology is the key to a breakthrough in paranormal research. Yet at no site and in no ghost investigation reference book did I encounter a coherent, referenced explanation for the various equipment used and data gathered. ARIGs matter-of-factly state that the equipment records environmental disturbances related to paranormal activity without considering normal variance or calibration.

Reliance on equipment mimics the current television portrayal of paranormal investigation. Television shows give us a simplified and optimistic representation of science (Collins 1987). Science, viewed by laypersons, is about the symbols (such as paraphernalia and certain personal characteristics of scientists) and end products (Toumey 1996). Use of equipment suggests objectivity—others can see the obtained numerical data from which the results are concluded.

Public Acceptance of "Sciencey" Things

Science has considered but provisionally rejected claims of ghosts, cryptids, and alien spacecraft. Yet the public has a high interest in such ideas. To them, seemingly paranormal phenomena are unknown and deserve serious attention. When most respectable scientists eschew paranormal topics, self-styled experts outside of science step in to provide support and legitimacy for public interest (Westrum 1977). We can say with certainty that there are presently well over 1,000 of these groups active in the United States to serve these interests.

Specialized skills and high standards characterize scientific work. However, hardly any ARIG lists formal scientific training as a desired qualification of its members. ARIG members generally do what appear to be respectable, convincing, and "sciencey" things. The public mostly relies on heuristics, looking for cues that suggest a source of information is knowledgeable and sophisticated. Because much of the public has little understanding of the rigor and practices of science, it is easy for nonscientists to adopt a hollow likeness of science that misrepresents it. The average observer would not have the background knowledge to determine that ARIG portrayal of a "high-tech" paranormal investigation is ineffectual and without a sound foundation in scientific principals. ARIGs deliver sham inquiry—a process that gives the impression of scientific inquiry but lacks substance and rigor.

Those who are anxious about the current state of science education, especially informal science education, may have a justifiable concern about how "reality" popular television portrays the scientific endeavor and who gain public credibility as investigators or scientific researchers. ARIGs often promote their paranormalist viewpoint as scientifically based, especially in community presentations or lectures at educational facilities. While scientifically minded observers can readily spot the anemic and shoddy scholarship of popular paranormal investigation, the public, unaware of the fundamental errors ARIGs make, can be persuaded by jargon and "sciencey" symbols.

Notes

1. Such as Galaxy Zoo or the Audubon bird count surveys.

2. Ghost Adventures Crew claims over 600 members (www.webcitation.org/5y3t6VBdK). Neither TAPS nor GAC require any scientific training for affiliated members.

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Antimatter Pseudoscience

Claims that antimatter annihilation can generate limitless power or lead to unbelievably destructive bombs are greatly exaggerated, as can easily be shown by running a few numbers.

JOHN EADES

Few topics in science excite the popular imagination more than antimatter, perhaps because the idea sounds like science fiction that you can really believe in. For the same reason, it should not be surprising that when a story about antimatter surfaces in the news cycle—as regularly happens—the real science sometimes gets parked on the shelf and media-promoted pseudoscience takes over.

Matter

To put antimatter pseudoscience in perspective, we first need to recall a few things about the genuine article. Atoms of the chemical elements that form the matter of the world around us are themselves constructed from just three varieties of fundamental particle: protons, which carry a positive electric charge; electrons, which carry an equal amount of negative charge; and neutrons, which have no charge at all, although, like the other two, they have magnetic properties. The hydrogen atom is the simplest of all. It consists of a single electron bound by electrical attraction to a nucleus consisting of a single proton. It is therefore electrically neutral. Atoms of heavier elements just have more electrons bound to their nuclei consisting of an equal number of protons and a variable number of neutrons. They are, then, normally neutral.

Another Matter

Even before all this was established, the idea was entertained that a kind of mirror matter might exist made of particles with reverse "signed" attributes like charge and magnetism. Thus Arthur Schuster (Schuster 1898), observing that electric charge plays an important role in nature, asked the rhetorical question, "If there is negative electricity, why not negative gold?" Some thirty years later, English physicist Paul Dirac showed that if quantum mechanics and special relativity—the two cornerstones of modern physics—are to hold simultaneously, it must be possible for counterparts of the three fundamental particles to exist that have the same mass as, but opposite electric, magnetic, and other properties to, the originals. These he called "antiparticles." We might then legitimately ask: If there are antiparticles, why not antimatter?[1] Foreseeing this possibility, Dirac (Dirac 1933) intimated: "We must regard it as an accident that the earth (and presumably the whole solar system) contains a preponderance of negative electrons and positive protons. It is quite possible that for some of the stars it is the other way about. . . . There would be no way of distinguishing them by present astronomical methods." Positively charged antielectrons, produced in the atmosphere by cosmic rays, were duly discovered (and soon afterwards found emerging from some radioactive substances). A few decades later negatively charged antiprotons were produced in the laboratory by directing fast-moving protons into metal targets. Antineutrons, displaying opposite magnetic properties to neutrons, were almost immediately added to the list, and nuclei of heavy antihydrogen (which consist of one antineutron and one antiproton) followed ten years or so later. Very recently, a few antihelium nuclei have been seen.

Antimatter Pseudoscience

Were this the whole story it would not be such an inviting field for pseudoscientific mumbo jumbo. However, Dirac had also shown that antiparticles and their corresponding particles annihilate each other on contact, thereby releasing, via Einstein's famous equation $E = mc^2$, the energy equivalent of twice their mass. And if antiparticle annihilation produces enormous quantities of energy, why not antimatter bombs and antimatter power generation? Clearly intrigued by the former possibility, members of the U.S. Air Force began to appear at scientific conferences on antimatter in the early 1990s. So did the late science fiction writer Robert L. Forward,[2] who had a background in research and a reputation for including only reasonably hard science in his novels. In 1996 a few very fast-moving antihydrogen atoms—antielectrons electrically bound to antiprotons—were produced at the CERN laboratory in Geneva (CERN 1996). Could this breakthrough lead to limitless power sources or unbelievably destructive bombs? Some sections of the world media evidently thought so and exploded with headlines like "Scientists create the

fuel of science fiction," and "Antiworld flashes into view." Even Sir Joseph Rotblat, world-renowned physicist, Nobel Peace Prize winner, and one of the architects of the 1963 nuclear test ban treaty, warned of antimatter bombs thousands of times more devastating than the hydrogen bomb (Rotblat 1996).

NASA and Hollywood Fantasies

Things ratcheted up several more notches when in 2004 the *San Francisco Chronicle* published the article "Air Force Pursuing Antimatter Weapons" (Davidson 2004). This concerned a talk given by a certain Kenneth Edwards, director of the U.S. Air Force's Revolutionary Munitions team, at a conference organized by NASA as part of its *Institute for Advanced Concepts (NIAC)* program. His report—sprinkled with Old Testament biblical references and maps showing missiles zigzagging over the Middle East—talked enthusiastically of revolutionary antimatter energy sources, rocket propulsion systems, and hand-held (yes indeed!) antimatter weapons.

We haven't heard much of Edwards in recent years. We have, however, heard a lot about the 2009 movie version of Dan Brown's *Angels and Demons*. In Brown's book a lump of antimatter produced by the CERN Large Hadron Collider (LHC) is stolen and used to create mayhem in the Vatican as an act of revenge against the church for its persecution of Galileo. CERN had had an embarrassing mishap the previous year when the LHC had to be switched off for serious repairs shortly after it was inaugurated. Evidently thinking that all publicity is good publicity, it allowed the Hollywood promotional machine to take over its premises and use its good name as a platform to sell the movie, the lead actors, and their preferred brands of fashionable consumer goods. It also, apparently, chose not to point out on that occasion that the LHC has exactly the wrong characteristics for making antimatter anyway. Rather than having too little energy to function as efficient producers of antiparticles, its colliding protons have far too much. Even the 1996 antihydrogen atoms, made from antiprotons emerging from less violent collisions in a much lower energy accelerator, were moving so fast that they zipped through the laboratory in nanoseconds and annihilated on encountering the first obstacle they met.

Hollywood's visions of powerful antimatter bombs are pure fantasy.

Here is the big problem: Whether you just want to study antiparticles closely or use them in fuel cells or bombs, you must hold large numbers of them still rather than have them self-destruct in nanoseconds.

Collecting Antiparticles for Research, Fuel, and Bombs

Here is the big problem: Whether you just want to study antiparticles closely or use them in fuel cells or bombs, you must hold large numbers of them still rather than have them self-destruct in nanoseconds. For this you need some kind of bottle. An antiparticle striking the walls of any ordinary bottle will, of course, instantly annihilate. It is not too difficult, however, to construct "bottles" with "walls" made of electric and magnetic fields, which will send any approaching electrically charged antiparticle backward if it is moving slowly enough. Since antiparticles will also annihilate if they hit any gas molecules remaining in the bottle, its air must be pumped out to a level such that few will be lost in this way in the course of a given experiment. Even at one billionth of the pressure of the atmosphere, each cubic centimeter of air contains many billions of molecules, so this is not easy.

Particles and antiparticles of either

charge can nevertheless now be bottled without much trouble. In late 2010, again at CERN and again without recourse to the LHC, simultaneously bottled antiprotons and antielectrons were once more induced to bind together into a small number of antihydrogen atoms (Hangst 2011, Yamazaki 2011). This time they were moving very slowly—only a few hundred meters per second. At such low speeds, a configuration of electric and magnetic fields could be found that was able to bottle even these electrically neutral entities, albeit for only a fraction of a second. This has triggered yet another wave of pseudoscientific speculation about antimatter fuel and weaponry.

Running the Numbers

How are we to deal with these fevered imaginings? In his book *Superstition*, Robert Park (Park 2008) demolished Gerald O'Neil's 1974 fantasy of solving the world's overpopulation problem by accommodating the surplus in space colonies. This he did by what he calls "running the numbers." Let's try to highlight the absurdity of these antimatter fantasies by doing the same.

First we can discard the idea of collecting antiatoms (antihydrogen, for example) for such purposes instead of their component antiparticles. Getting the latter to bind together presents enormous technical headaches, which is why it has taken so many years to synthesize a mere handful of antihydrogen atoms. Moreover, there is no concomitant gain in the resulting annihilation energy yield, since it is the unbound components that annihilate anyway. We can also reject antielectrons and antineutrons as fuel or bomb material since the former have only about 1/2000 the mass of antiprotons (and therefore produce that much less energy per annihilation)[3] and the latter because after about fifteen minutes, they decay into antiprotons anyway. We are thus left with antiprotons as our fuel or high explosive.

Suppose then that we had bottled every antiproton ever produced at CERN since 1956, the year they were first observed. How much energy would be released if we opened the bottle and allowed them all to annihilate? A rough guess at CERN's aggregated antiproton yield since 1956 is about one hundred trillion (10^{14}). Current technology limits the largest number that can be bottled as described above to about 10 million (10^7). Even with the best vacuum presently achievable, these will only survive against annihilation by air molecules for a few weeks. Let us nevertheless put our faith in technological advances, dismiss such objections as the product of insufficiently imaginative minds, and do our energy calculation as if we could indeed have bottled all 10^{14} antiprotons produced at CERN over the fifty-five years since 1956.

The energy equivalent of the proton and antiproton masses amounts to a few ten-billionths (3×10^{-10}) of a joule.[4] One joule will power a one-watt flashlamp bulb for one second. Our 10^{14} bottled antiprotons would therefore produce 30,000 joules, just about enough energy to light a sixty-watt bulb for eight or nine minutes. Trying to solve the world's energy problems by antimatter annihilation evidently brings an entirely new dimension to the idea of doing things the hard way.

Trying to solve the world's energy problems by antimatter annihilation evidently brings an entirely new dimension to the idea of doing things the hard way.

Now let's calculate how long it would take to accumulate enough antiprotons to get the explosive power of a large hydrogen bomb, say ten megatons, with an energy equivalent of around forty thousand trillion (4.18×10^{16}) joules. Presently we can bottle about two million antiprotons per minute, equivalent to six ten-thousandths (6×10^{-4}) of a joule. The accumulation time needed for our 10 Mt bomb is therefore seventy million trillion (7×10^{19}) minutes.

This is roughly 10,000 times the age of the universe—rather a tall order, you might think. Technophiles will nevertheless again argue that future improvements should be taken into account. Let's be generous and allow them a factor of 20 billion or so to cover this, bringing the accumulation time down to a mere 7,000 years. So to have made such a bomb available now, with these quite impossible improvements, we

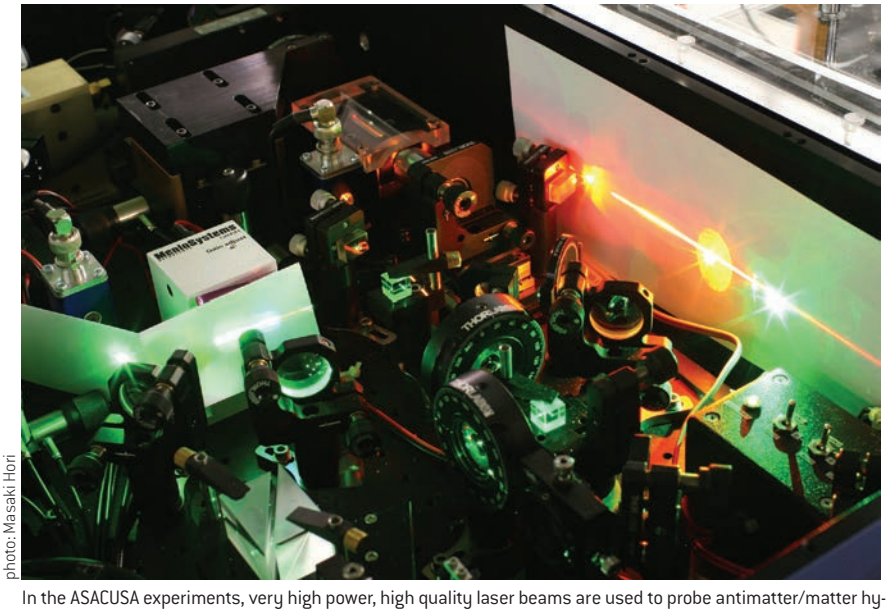

photo: Masaki Hori

In the ASACUSA experiments, very high power, high quality laser beams are used to probe antimatter/matter hybrid atoms.

would "only" have had to start accumulating around the dawn of recorded history. No time out for equipment maintenance or breakdowns; no holiday, meals, or comfort breaks for the operators of course; just continuous accumulation, day and night, week after week, month after month, year in, year out, century after century.

Still More Problems

There is one overriding consideration I haven't yet mentioned: any antiparticles we make in the laboratory, we create out of energy itself ($E = mc^2$ is here working backward, so to speak). So when they annihilate we only get back energy we originally used up. Not all of it by any means. Nature is not so kind as to give us back even the energy we expended, having decreed that antiparticle creation is a hopelessly inefficient way of storing energy.

What this suggests is that we would be better off going and getting a few bucketfuls of the stuff from one of those antimatter stars. Here I refer you once again to Robert Park's book (Park 2008) in which he shows that travel to even a nearby star within a human lifetime would consume many thousands of times the entire annual energy production of Earth. And as if this wasn't enough, astrophysicists, far and wide in the cosmos though they have looked, have never seen even a hint of any such stars.

Back to Real Science

Why this should be so is one of the great mysteries of modern physics. It is as if nature provided herself with two Lego kits for assembling different worlds but then left one of them in the box. To the best of our knowledge the instruction manuals—the laws of nature—are identical for the two kits. Have we perhaps misunderstood these laws?

When all else fails, read the manual is worthwhile advice for anyone faced with computer hardware behaving in similarly mysterious ways. Likewise, a guiding principle of real science is that our understanding of even well-established natural laws should always remain open to question. Careful re-reading of what might be called the fine print of these laws may yet reveal some minute asymmetry between matter and antimatter that has so far escaped our attention but that on a cosmic scale results in the world we see rather than the one we expected to see. Such is indeed the aim of current space-based (AMS 2011) and laboratory (Hangst 2011; Yamazaki 2011) experiments.[5] But that, of course, is another matter.

photo: CERN

General view of the experimental hall at CERN where physicists from sixteen countries carry out real science experiments on antimatter.

Notes

1. The media normally make no distinction between *antiparticles*—the fundamental building blocks of antimatter—and *antimatter* itself (antiatoms, antimolecules, antistars etc.). In this article, I use *antimatter* in the latter, more correct sense.

2. Bob Forward was both likeable and knowledgeable, and I got on well with him on the few occasions we met. His pet project was neither power generation nor weaponry but an antimatter space propulsion system, in which annihilating antielectrons (which are usually and illogically known as positrons) heat a working rocket propellant instead of being used as a primary fuel.

3. NIAC, buried by NASA in 2007, was resurrected in 2011. Apparently following up Forward's antielectron idea (www.nasa.gov/exploration/home/antimatter_spaceship.html), it nevertheless estimated in 2006 that "only" ten trillion trillion antielectrons (ten milligrams) would be needed for a manned trip to Mars along these lines. This is outside the scope of the present article, but their subsequent silence implies that even this relatively modest scheme got nowhere.

4. $2mc^2$, with $m = 1.67 \times 10^{-27}$ kg and $c = 3 \times 10^8$ m/s.

5. In antimatter research things are currently moving somewhat faster than a speeding bullet. Since March 2011 when I began to write this article, the Alpha Magnetic Spectrometer (AMS above) has been launched to the International Space Station, antihydrogen atoms have been bottled on the order of fifteen minutes, the antiproton has been "weighed" with precision equivalent to weighing the Eiffel tower on a machine sensitive enough to detect a sparrow landing on it, and a kind of Van Allen belt of trapped antiprotons has been detected near Earth. Not surprisingly, some reports of these items of science news have indulged in the usual hand-waving fantasies about weapons, power, and space propulsion. Discussion of these developments must, however, await a future article.

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SI Column on Teacher Unions Generates Storm of Reader Reaction

A "Science Watch" column on teachers unions in our November/December 2011 issue generated a storm of critical reaction. We received more than forty letters about it, and they were overwhelmingly negative. Three readers canceled their subscriptions. We can publish only a sampling of responses. At the end are brief responses by the editor and column author Kenneth Krause.

Upon receiving the November/December 2011 issue of SI, I was quite excited to see that there was an article on teachers unions. As a supporter of CSI and a subscriber to both SI and *Skeptical Briefs,* I was finally going to be able to read a balanced article that presented both pros and cons of these groups consistent with the quality that I have come to expect of the magazine. I was quite surprised and frustrated that author Kenneth Krause simply chose to parrot the multitude of articles bashing the unions without any critical thought put forth. Yes, Krause does point to a few sources in order to back his claims, but he fails to mention that there are legitimate questions and arguments about the validity of the data and conclusions. Without getting into this debate, as letters to the editor are limited in length, let it be clear that research in education is quite fuzzy compared to the research done in the true sciences such as physics. Instead of presenting a balanced article, Krause is happy to espouse his brand of politics under the guise of "skeptical thinking." As a high school physics teacher who promotes CSI and skeptical thought in general, I am very disappointed in SI. Your readers deserved better.

Rich Schram
Mt. Prospect, Illinois

K.W. Krause's commentary is an uncritical regurgitation of old right-wing attacks of questionable validity on public education using teachers unions as scapegoats. Both T. Moe and C. Hoxby are funded by a conservative propaganda mill, the Hoover Institute. They have made a career supporting vouchers, charter schools, and privatization. Their results and methods have been discredited by better studies. (Richard D. Kahlenberg, "Scapegoating": www.tnr.com/book/review/special-interests-terry-moe.) Indications of bias in the article include using only two one-sided studies, quoting opinions without data, and exaggerating the influence of teachers unions' political contributions.

Krause added twenty-one years of contributions to reach the large figure of $59,354,731, failing to note this amounts to only $2,826,485 a year. Businesses contributed three times as much as unions in hard money and seventeen times as much in soft money in 2010. He pointedly reports that teachers gave 95 percent of this to Democrats, who support increased funds for education and collective bargaining, rather than to Republicans, who cut funds for public schools, favor for-profit private charter and religious schools, and oppose unions generally. Totaling all contributions, businesses gave $200,133,201 to the GOP; labor gave only $11,200,489 to the Democrats (www.opensecrets.org/overview/blio php).

If SI wants to open up the question of the causes of school failure to debate, the editors will need to make available lots of space to cover the controversies on income, race, class size, per pupil expenditures, magnet schools, standardized tests, etc.

The ten states that do not permit teachers unions all have lower test scores than the states with high rates of unionization. Nonunion charter schools do not improve test scores over comparable public schools. This letter is simply a request for fair and objective consideration of all the relevant data before leaping to the conclusion that getting rid of teachers unions would improve public education.

George Cunningham, MD
San Francisco, California

SKEPTICAL INQUIRER is a magazine for science and reason. Yet Kenneth Krause's anti-union screed is neither scientific nor reasonable; it is a one-sided attack on teachers unions. I could not discern any attempt to seek or consider a unionist perspective in the article. It is a political piece, pure and simple, that would play perfectly into the hands of those politicians like Scott Walker and others who would destroy public employees' unions.

Charles Cairns
Professor Emeritus of Linguistics
City University of New York

To me, Kenneth Krause's article on teachers unions reads more like a political document than a skeptical analysis; it has nice stories but not a proper analysis. Some objections:

Krause describes correlations and treats them as causality.

Society has contemporaneously undergone many cultural changes since the 1950s besides the unionization issue discussed. How do we know what is to blame?

If unionization is the problem, wouldn't we see dramatically better and cheaper education in less unionized, southern states? My impression is that we see cheaper but worse education.

Focusing only on teachers and unions implies that the biggest waste of education money is in the area of teacher pay, and fixing this area would largely fix the system.

My own "bias" is that there are significant problems in administrative costs, political patronage (I live in New Jersey), and misguided educational initiatives. The problem is educational results versus costs, and I challenge Krause to provide a broader perspective—quantify how much of the problem is teachers unions.

Ron Gilman
Mongomery, New Jersey

Krause certainly lays on a diatribe against teachers and administrators who belong to unions. His thesis is that public education in the United States fails because of selfish union teachers and administrators. His belief is supposed to be a simple one—except if we look at states where unions are banned, the results are the same.

If you examine U.S. education, the children who do poorly in school are almost exclusively from poverty homes. Another part of the equation is that in school systems where the school populations are under reasonable economic standards, the results match our highest national standards.

A better analysis of U.S. education is to examine poor children's lives where about 20 percent of U.S. births have no prenatal care and only limited early child care. The effects of this disastrous policy begin a series of actions and problems all related to poverty—no money, inadequate diet, no quality child care, life-threatening stresses, no conversation, no hugging; the whole gamut of early care is neglected.

Richard D. Holland
Chairman, Building Bright Futures
Omaha, Nebraska

I'm not surprised to see political hatchet jobs about unions on Fox News, but I was surprised and disappointed to see one materialize in the SKEPTICAL INQUIRER. It had the sort of drivel and inconsistencies that SI so accurately points out in bad science reports, creationism journals, and UFO tabloids. Why would SI publish such a piece?

It opens with a quote from someone at the top of the educational pay scale. It continues by referencing "scholars" from Stanford and the Hoover Institute, which currently gives shelter to such discredited right-wing reality warpers as Condaleeza Rice, Donald Rumsfeld, Spencer Abraham, and Newt Gingrich. Terry Moe continues to espouse discredited data.

The rant about the unbridled wealth and "armies of well-trained activists" of the NEA is a good example of the unfair and unbalanced quality of the article. The Koch Brothers raise obscene amounts of money to fund folks and phony front organizations who would have creationism and prayer in the public schools. Yet Krause is worried about the NEA making donations to the Democratic Party.

The suggestion that underpaid teachers gaining bargaining rights in the'60s is the single variable affecting student performance is ludicrous. No mention of any number of other technological and social factors.

William Grasha
Madison Heights, Michigan

Kenneth Krause states that unions are bad for student performance as an overall premise and then makes his arguments against unions. Teaching is now a profession with standards, thanks to the union. After thirty years of teaching, I have noticed that environmental factors and class size do make a difference. While teaching in NYC, I often noticed how difficult it was to teach when a large part of the student body was absent each day. Is it scientific to only pick negative studies from an enormous body of research? Should politicians decide whether teachers are good or bad? Should teachers have no security rights? Without unions we would be back to a society where teachers were not valued and were considered a burden on society when they retired poor. After many years of refining my skills, I was voted teacher of the year for the Bronx high schools. Becoming a great teacher requires experience. I went through public schools in the Bronx and became a mathematics teacher in the same high school I attended as a child. If Krause wants to destroy unions and teacher rights in his biased nonscientific article, it doesn't belong in SI. It belongs on Fox News or in some right wing conservative magazine.

Norman Levine
Nanuet, New York

While teaching in NYC, I often noticed how difficult it was to teach when a large part of the student body was absent each day. Is it scientific to only pick negative studies from an enormous body of research? Should politicians decide whether teachers are good or bad? Should teachers have no security rights? Without unions we would be back to a society where teachers were not valued.

I am completely stunned with shock and dismay by the article. There are so many questions/issues with it that I cannot articulate them coherently in a reasonable space. I'm sure you'll be getting follow-up articles from people with real writing/research credentials that will be clearer than my following concerns:

1) No balance at all
2) No summary of facts on what the first unions did and how they changed over time
3) No summary of facts on what percentage of each of the aspects of collective bargaining are part of each contract (i.e., what percent of contracts have paid time off for union meetings?)
4) No summary of facts on what percentage of contract items is actually used (i.e., how many hours of time off for union meetings are actually taken by each teacher?)
5) Only two researchers cited (although I see on Wikipedia that they really are economic researchers with Stanford and the journals in which they published are peer-reviewed).
6) There is no indication of any controversy surrounding these papers: Google shows there are plenty of disputes and other studies that show that unions have a positive effect.

Where are these references to competing research?

Rex Marzke
Houston, Texas

I write to communicate my disappointment upon reading Kenneth Krause's polemic against teachers unions. To have such ideologically myopic venom appearing in a column titled "Science Watch" is profoundly incongruous. Krause falsely presents his perspective as though it is underpinned by scientific certitude. References from academic journals of economics and political science are not substantive enough to warrant his tone of absolutism.

Krause needs to find an appropriate vehicle for his partisan rant. I recommend *The Weekly Standard*, where his perspective would be at home and considered worthy of debate. If he seeks greater public notoriety, he could proffer his subjective opinions on Fox Television.

I have been a very satisfied subscriber to SI for over three decades. Your editorial decisions have typically justified your subheading as "the Magazine for Science and Reason." Please redouble your efforts to print articles worthy of your fine publication.

Lincoln C. Miller
Hillsdale, Michigan

Because two Hoover Institute fellows were the only scientific support for the article on teachers unions, I don't believe it. Hoover fellows find whatever fits Hoover's right-wing ideology. These two fellows didn't even look at student test scores like everyone else. Instead, they looked at remotely related variables to get the answer that fit their ideology: the answer that teachers unions are bad. Unbiased investigators found the contrary. A review of fifteen studies by Robert Carini (2002) concluded that "unionism leads to modestly higher standardized achievement scores."

How can we trust Hoover fellows when they find global warming is a hoax? Hoover fellows support other unscientific nonsense because of their ideology. And don't even get me started on the eight Hoover fellows who advised Bush to invade Iraq.

If the Hoover fellows weren't bad enough, the article cites the maudlin movie *Waiting for Superman* as a credible source. Even Hollywood didn't consider this a documentary when looking for Oscar candidates. One reviewer called it a "slick marketing piece full of half-truths and distortions." Investigators found some scenes were faked to be tearjerkers. The spine-tingling last scene shows kids waiting for the lottery ball to drop—the ball that tells whether they go to horrible public schools or wonderful charter schools. This is great drama that makes you cry, but it is balderdash. Some charter schools are total frauds; they list kids who never attend. Some are excellent. On average, they are poorer than public schools.

These three facts show the absurdity of the article's attack on teachers unions:

1. Heavily unionized Finland has the highest test scores in the world.
2. Heavily unionized Massachusetts has the highest test scores in the United States.
3. The southern states, which are almost free of unions, have the lowest test scores of the states. Free from unions, the southern kids should knock the top out of the tests according to this absurd union hit piece.

Harold A. Scarbro, PhD
Scarbro Educational Consulting, Inc.
Las Vegas, Nevada

When I taught in Appalachia without any union support, one teacher was dismissed for poor performance: his basketball team was losing. Other teachers were dismissed at the end of the year with no due process, but learning outcomes were still very poor after that. Why not look at countries with teachers unions to see if outcomes really are worse than those of Mississippi or Alabama. (No unions there). Countries where teachers unionize do tend to have much better literacy overall than many, many places without unions in the United States.

People may not like to join a profession with unfair dismissals. Can we grade doctors on their performance and outcomes, getting rid of doctors with poor outcomes? Who would want to go into oncology? Likewise, what kinds of teachers want to go into a school where the environment is one of abject poverty? Idealists, perhaps, wanting to make a difference? To me, those Appalachian teachers, constantly facing the threat of dismissal and working under poor conditions for low wages, were unsung American heroes. I am glad I now live in a country where the right to unionize and negotiate is protected by law, as a right to assemble under the Charter of Human Rights and Freedoms in Canada—hardly an illiterate nation.

Carolyn Robe
Teacher
Ft. St. John, Canada

Editor Kendrick Frazier responds:

Thank you for all the passionate responses. First, we don't publish "diatribes"; we publish informed analyses. Second, our regular columnists have considerable latitude; if this column varied some from our usual science-related topics, it did deal with a possible effect on educational outcomes, certainly something all teachers and supporters of education should be interested in. Third, readers should not ascribe political motives to the author or SI; we always emphasize evidence-based analyses, but they may result in a wide range of viewpoints. I saw the column as a useful, if possibly controversial, examination. If it was flawed, as so many of you say it is, then open debate and inquiry about it are part of the journalistic and democratic process. Thus this letters section.

Kenneth Krause responds:

It's fine to have political predispositions, I suppose. In any case, they appear to be exceedingly common. Ideological sacred cows are another thing altogether. Yes, Republicans should learn to fairly reevaluate their irrational or semi-informed positions on stem cell research, abortion, global warming, and evolution, for example. But if Democrats and economic liberals fancy themselves so different—impervious, perhaps, to any form of reckless enthusiasm or attachment—they clearly have another thing coming.

Public sector workers—teachers most especially, in my opinion—should be commended and rewarded for their hard-fought accomplishments. But candid exchanges over critical social issues like K–12 education should never be discouraged or suppressed—particularly through spurious, ad hominem *political accusations or conveniently narrow or perspective-dependent definitions of "science" or "skepticism." At least some protesting writers have a personal stake in the issue's resolution as well. But all who are genuinely concerned about the sagging American education system—and*

Candid exchanges over critical social issues like K–12 education should never be discouraged or suppressed—particularly through spurious, ad hominem political accusations or conveniently narrow or perspective-dependent definitions of "science" or "skepticism."

about the welfare of both students and teachers—must learn to place their politics and their special interests aside in order to fairly reevaluate teachers unions.

I won't descend to the level of those who appear to use politics or to speciously invoke science's good name in an effort to quash this discussion. But I will address the familiar contentions that American students in southern, nonunion states tend to underperform relative to those in northern collective bargaining states and that students in other unionized countries—Finland and Singapore, for example—perform quite well. Generally, these contentions are true. But it simply doesn't follow, as teachers unions firebrand Randi Weingarten frequently proposes, that collective bargaining for teachers does not have a negative impact on student achievement.

Analyses drawing this unfounded inference fail to account for other important factors. For instance, Finland's size, homogeneity, family structure, low poverty levels, and liberal investment in education are often ignored. So, too, are the deep cultural variances and historical complexities in America that any middle-school civics student should understand well. Southern states have long suffered the devastating effects of racial segregation, meager funding, and an undereducated adult population, whereas their northern counterparts largely have not. The southern shortfall may evidence many societal ills, but it clearly does not speak to the merits of collective bargaining.

Note too that the general contention is not always true. Public collective bargaining activists in my home state of unionized Wisconsin, for example, often flout our students' recent performance relative to those in nonunionized Texas. But, again, they disregard critical demographic data. Although Wisconsin students outperform Texas students on average, white, black, and Hispanic students in my state actually come up short when compared to their racial counterparts in Texas. Why? First, black and Hispanic students generally underperform relative to white students in both jurisdictions. Second, white students in Wisconsin represent a much larger proportion of the total student population. When one scrutinizes the data more carefully, in other words, the unionists' generalization fails.

I also take exception to certain writers' claims that my argument is "anti-union." The evidence I provided does not condemn private-sector unions. But the public sector is another matter entirely. Unlike their private counterparts, public unions have little or no incentive to moderate their demands with sober considerations of affordability and efficiency, let alone for the very existence of their members' livelihoods. Of course, taxpayers, unlike private-sector consumers, cannot simply "opt out" by taking their business elsewhere. Like Franklin D. Roosevelt—champion of the Wagner Act and perhaps unionism's greatest historical advocate—I recognize that collective bargaining is inherently anti-democratic and should "not be transplanted into the public service."

Nor should we disregard common sense. How can collective bargaining rules that make it nearly impossible to terminate bad teachers possibly be in the interest of students? How about the ones that pay teachers based only on time in service and largely useless degrees but never on reasonable determinations of merit? Or those that allow teachers and not administrators to employ the former where they are needed most?

Public employee collective bargaining is an improper and potentially despotic delegation of critical governmental powers to unelected special interest groups—some of which are more powerful and self-sanctimonious than others. Like everyone else, teachers might be excused for advancing their own interests. But no more idols; no more sacred cows. America can no longer support their heft, and the social stakes for average citizens and their children are entirely too high.

Kenneth W. Krause
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Ghost-Busted! Phony Tales of *Dixie Spirits*

JOE NICKELL

In his book *Dixie Spirits: True Tales of the Strange and Supernatural in the South* (Fall River Press, 2011), Christopher K. Coleman labels me "everyone's favorite cynic" (280)—apparently confusing the word with *skeptic*, for I am clearly the latter and not the former. I suspect he simply means to be disparaging, but how would *he* like it if I called him a crank or a huckster?

Coleman's book is one of those works written in a breathless style in which phrases like "it is said that" abound and in which one looks for documentation in vain. It happens, however, that I am familiar with many of his tales—indeed I have investigated them and reached very different conclusions regarding them. Here is a sampling that I trust will show the superiority of actual investigation over mere mystery-mongering and remind us of the usefulness of Occam's razor, the principle that the hypothesis with the fewest assumptions is to be preferred.

Pirate's House Inn

Coleman suggests that an eighteenth-century hangout of smugglers in Savannah, Georgia, is the actual haunt of old buccaneers' ghosts—if not of Blackbeard himself, then at least "the storied pirate Captain Flint." Indeed, "it is said that" Flint died at Pirate's House Restaurant; his ghost and the ghosts of others at that location, Coleman insists, are "real enough" (pp. 65–66).

Actually, "Captain Flint" was a fictitious character in *Treasure Island*, Robert Louis Stevenson's 1883 tale of pirates' greed and revenge. Although Coleman claims that "Flint" was an actual historical character, it has never been proved—suggesting that a fictional character is as capable of haunting a place as a real one (Nickell 2009)!

Plantation Ghost

Coleman is even more certain about a female ghost—the central specter at Louisiana's Myrtles Plantation, which has "no fewer than fourteen ghosts." Coleman tells how she, "a mulatto slave named Chloe," poisoned the family of then-owner Judge Clarke Woodruff. Chloe—whose ear Woodruff had reportedly cut off to stop her eavesdropping—had supposedly intended only "to make the family ill, thinking that she would then step in and nurse them back to health" (102) and thus regain favor. Instead, three died and the other slaves administered justice by hanging Chloe. Now her ghost—wearing the green turban she used to conceal her missing ear—appears to residents and visitors alike. Ghost hunters have even recorded strange phenomena, including "photographs of 'orbs,'" at the old plantation house (105).

I investigated the Myrtles for a *Discovery Channel* documentary and was on location there—I even spent the night on August 14, 2001. No source that I could discover provided evidence that the Chloe tale was true. Indeed, it proved not to be folklore but fakelore. Although there are many *variants* (as folklorist say), apparently all are of modern vintage. Court archives fail to substantiate the existence of a slave named Chloe, and historians point out that the family members in question actually died in a yellow fever epidemic (Frank 2001; Williams 2003; Hamilton 1990). Furthermore, there are ready explanations for the touted "paranormal phenomena" (Nickell 2003; *Haunted* 2002). That Coleman does not know "orbs" are produced by the camera's flash rebounding from particles of dust or the like is troubling.

Gray Lady of Liberty Hall

At a stately Frankfort, Kentucky, mansion, once home to the state's first U.S. senator, the specter of "the Gray Lady" supposedly glides about, often appearing in a guest bedroom where "overnight guests would sometimes awaken to find themselves being tucked in by a smiling, matronly ghost." For example, one family member (a great-granddaughter of the senator), "returning home one weekend from college," reports Coleman, "awoke in the middle of the night" to find the Gray Lady "standing next to the bed" (95). Another woke to hear a music box playing a tune, even though it had not been played for years. One of the house's curators even took a photograph of the ghostly lady on the grand staircase.

Actually, the great-granddaughter, Mary Mason Scott, was home from *finishing school* in the 1880s, when she had her experience. Any such encounter that occurs when the percipient is lying abed is most likely to be nothing more

than a common "waking dream." That is a realistic hallucination that occurs in the trance-like state between sleeping and waking (Mavromatis 1987). Such visions are commonly of the ghost-at-the-bedside variety. That such an experience may be auditory as well as visual provides a probable explanation for the music box's illusory playing. As to the photograph, it was clearly that of an actual person who quickly traversed the stairs while the camera's shutter was accidentally stuck or was deliberately locked open. (For more on all these matters, see Nickell with Fischer 1992, 19–33.)

Although Coleman claims that "Flint" was an actual historical character, it has never been proved —suggesting that a fictional character is as capable of haunting a place as a real one!

Flatwoods Monster

Not all of Coleman's "tales" (an appropriate term) concern alleged ghosts, as this example shows. It is the story of the monster that appeared in the wake of a fiery UFO over Flatwoods, West Virginia, on September 12, 1952. Boys playing on the school grounds before dark saw a bright light streak across the sky and then land on a nearby hill. They rushed to the site, along the way picking up three other boys, the mother of two of them, a dog, and a flashlight. Suddenly they encountered a six-foot monster with shining eyes that glided toward them, scaring them terribly. Although Coleman does not state that he ever visited Flatwoods himself (he even gets two boys' names wrong; Coleman gives Gene Lemon's name consistently as "Lamon" and Neil Nunley's once as "Mundy"), he says of my own investigation, "Nickell studiously avoided interviewing anyone who could have corroborated the Flatwoods Seven's story."

In fact, as readers may have expected, that is a blatant falsehood. I talked at length with Max Lockard, who was at the site on the evening of the incident and confirmed that the eyewitnesses were genuinely frightened. He also explained that skid marks and a black residue from the supposed flying saucer, discovered the next day, had been caused by his pickup truck with a leaking oil pan! On my behalf, he called Kathleen May, the mother of two of the boys, but she declined to speak with me then. Later, I called May myself, twice, but both times she said she was not feeling well and suggested I call her son Fred. When I did, he refused to speak about the monster, saying he had an agreement to give his story to another person exclusively (probably Frank C. Feschino, Jr.; 2004). Fred May did tell me that his mother no longer knew *what* she had seen (Nickell 2000a).

My investigation revealed that the UFO the boys had seen was a meteor, witnessed over three states. Coleman dismisses the possibility on various grounds, saying, for example, "No meteorite, or fragments of a meteorite, were ever found at Flatwoods or at any other place in the area" (282). But that is to be expected, because the meteor only *appeared* to land at the site, a common illusion. Noting that eyewitnesses described the "monster" as having a face shaped like the ace of spades with shining "animal eyes" and that the creature glided toward them, emitting a high-pitched hissing sound and exhibiting "terrible claws," I identified it as a barn owl that had been perched on a limb (Nickell 2000b). Coleman admits, "On the face of it, this explanation seems quite pat" (281), but he presents other, dubious evidence in an attempt to discredit it and seems to have gotten my research from second-hand sources, as I have already answered most of his objections.

Other Tales

I could give many other examples of Coleman's lapses, for example concerning Mothman (see Nickell 2002a), Voodoo Queen Marie Laveau (Nickell 2002b), and more. But perhaps this small sample of his numerous failings will serve to warn readers away from this undocumented, untrustworthy book. ■

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Joe Nickell is CSI's senior research fellow. He has been investigating alleged paranormal phenomena since 1969 and is the author (or coauthor or editor) of thirty books. His website is www.joenickell.com.

My Ephemeral Friend

DON KEITH

I was talking to Aristotle the other day. That's right—Aristotle. How he found me I have no idea, but he spoke fluent English, a language that appeared far into his future. He had lots of questions, as you might expect from a fertile mind like his.

He wanted to know where Canada was, and I had to tell him about the Western Hemisphere being through the Pillars of Hercules and across the Sea of Atlas. He was already convinced that the world is a sphere and that if he went far enough west he would eventually get back to Athens from the east. However, he had no idea there was another continent in the way.

I told him what year it was, but that meant nothing to him. Apparently he didn't know anything about his future, which I suppose isn't surprising—although he did seem to have poked his nose into it. He was amazed to learn that I came from a time more than 2,300 years later.

It pleased him that the democracy his people had invented for governing Athens still seems to work better than anything else humans have tried over all these years. He understood when I told him most countries today are too big for the radical version used in his day, and he thought representative democracy should work well.

I told him we are much more comfortable nowadays. We eat better, most of us own or rent our own homes, and we get around by cars we operate ourselves—all of which impressed him. He thought fifty-story buildings sounded rather inconvenient until I told him about elevators. When I mentioned that we could fly anywhere in the world in less than a day he raised his eyebrows. I had to explain that it is airplanes that do the flying and that they carry hundreds of people at a time, get their lift from wings that don't flap, and weigh hundreds of tons. He was incredulous.

I didn't know how much time I had, so I pressed on. Communication has

been vastly improved, too, I explained. We can talk to people anywhere in the world simply by tapping out their number on a phone. We can also get news from anywhere, just as it happens. He had given a lot of thought to motion and had satisfied himself that nothing can travel instantaneously, so he found this hard believe. I could only hint that we use light for this and light does move really fast. I didn't think it would help to get into the concept of bouncing signals off satellites we've put in orbit just for the purpose of communication.

I told him about television and that we can actually watch events as they take place worldwide. I added that this includes big sporting events but because of time differences we often tape them and watch them later at our convenience. This he took to be a manipulation of time itself. I was clearly losing him.

He wanted to know if we had conquered death. I told him very few of us live beyond the century mark, which people also did occasionally back in his day, but a lot more of us come close to that. Our doctors can usually figure out what ails us and prescribe drugs to cure us. When a joint wears out, they replace it with an artificial one. When an organ fails, they repair it or remove it, which they can do painlessly. If we can't get along without the organ they can transplant one from someone who has just died, as they do with kidneys, livers, hearts, and lungs. "You transplant a heart from another person?" he asked. "That would change his personality and spirit, wouldn't it?" I didn't know how to answer that.

He wondered why people don't live forever if we can do all this. I explained that our bodies wear out because the cells from which they are made don't copy perfectly, so nothing works as well when we get older. This got me into DNA; his immediate reaction was that we must have the idea that humans are built according to blueprints. That seemed to him beyond the pale. He wanted to know if we thought the gods drew up the blueprints. When I told him the code has evolved on its own very slowly over the last four billion years, he wondered how we could possibly know what happened four billion years ago. I muttered that we have our ways.

Aristotle would surely be interested in knowing the Earth is not the center of the universe but rather just another planet like the five he already knew. But could he grasp just how insignificant it really is?

I didn't know where to go from there. Where should I start with electricity? Should I get into the Internet? Tell him about Google? Wikipedia? He would surely be interested in knowing the Earth is not the center of the universe but rather just another planet like the five he already knew. But could he grasp just how insignificant it really is?

Then it occurred to me that I could update him on something he had considered at length. He had dismissed Democritus's notion that all matter is made of indivisible atoms, and everybody went along with Aristotle because of his reputation. I had to report that Democritus was right after all, which Aristotle still doubted because it seemed to him water couldn't possibly be made of separate little pieces, much less air and fire. Maybe earth, he conceded.

I didn't argue but added that Democritus wasn't entirely right either because atoms aren't really indivisible; every atom has a structure with parts of its own. He now thought he had me in a corner because those parts can't be made of matter or I'd be talking in circles. So what are they made of? Okay, maybe I *was* in a corner.

I'm not sure Aristotle believed a word I had said. My frustration woke me up.

Don Keith, an actuary by profession, took up freelance writing twenty years ago. His book *Once Upon a Universe* delivers a subtle skeptical message by tracing what the historical sciences have taught us about our past. He can be reached at dkeith@sympatico.ca.

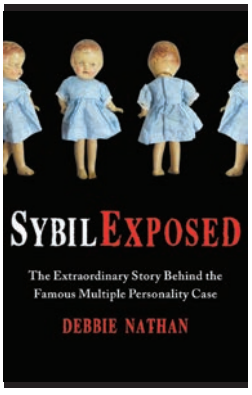
End to a Twisted and False Episode in Psychiatry

JAMES M. WOOD

Horror stories can reveal and feed a society's darkest fantasies. *The Monk*, the famous Gothic novel published by Matthew Lewis in 1796, is a striking example. With its portrait of lascivious monks and murderous nuns, *The Monk* reflected negative stereotypes about Catholics that were widespread in England during the late 1700s. It also helped to reinforce and perpetuate those prejudices for decades to come.

Sybil, published by Florence Rheta Schreiber in 1973, is another famously lurid book that both reflected and shaped the nightmares of its time. Gothically dark but with gleams of light, it recounted the supposedly true story of psychiatrist Cornelia Wilbur and one of her patients, a fragile young woman pseudonymously called Sybil to protect her identity. During eleven years of psychoanalysis Wilbur encountered sixteen of Sybil's "alternate personalities," which had supposedly developed during childhood in reaction to horrendous sexual and physical abuse by Sybil's mother. The book recounted how Sybil dealt with these traumatic memories under Wilbur's healing influence and gradually integrated her "alters" into a single stable personality.

A national best seller, *Sybil* was turned into an award-winning 1976 television miniseries with Sally Field as Sybil and Joanne Woodward as Wilbur. Soon afterward an epidemic of Multiple Personality Disorder (MPD), also known as Dissociative Identity Disorder (DID), swept across the United States, persisting through the 1980s and into the early 1990s. Only a handful of MPD/DID cases had previously been reported in the scientific literature. After *Sybil*, the number skyrocketed into the thousands.



Sybil Exposed: The Extraordinary Story Behind the Famous Multiple Personality Case. By Debbie Nathan. Free Press, New York, 2011. ISBN: 978-1439168271. 320 pp. Hardcover, $26.

The impact of *Sybil* was huge. For decades afterward its spellbinding narrative was accepted as factual. Schreiber declared in the book's preface that it was a "true story," and Wilbur herself vouched for its accuracy during television appearances and professional conferences. However, it is now clear that neither *Sybil* nor Wilbur should ever have been believed. In *Sybil Exposed: The Extraordinary Story Behind the Famous Multiple Personality Case*, investigative journalist Debbie Nathan has revealed the true story of Sybil, whose real name was Shirley Mason.

Drawing from archives that only recently have been opened to the public, Nathan presents a description of Shirley/Sybil and Wilbur that is both compassionate and devastating. With a wealth of facts and extensive footnotes, Nathan demonstrates that *Sybil*, both the book and the miniseries, were packed with lies and distortions. Marketed to the public as nonfiction, *Sybil* instead should have been shelved next to *The Monk* among the Gothic horror novels and other dark fantasies.

Sybil Exposed presents overwhelming evidence that Shirley/Sybil never enacted multiple personalities until she met Wilbur. The young patient's florid symptoms emerged and morphed over a period of years as she and Wilbur engaged in a complicated dance of mutually reinforced self-deception. According to her own admission, Shirley pretended to have alter personalities because she wanted Wilbur's attention. The doctor quickly became fascinated by the personalities and began planning how she might attain professional fame and money by publishing about them. Wilbur then began using suggestive questions and barbiturate injections to extract ever more bizarre allegations of childhood abuse from her increasingly disoriented patient. Meanwhile she recruited Florence Schreiber to write a popularized book about the case.

Eventually Wilbur collaborated with Schreiber to create a narrative full of fabrications. For instance, according to the book, Shirley's father once confessed to Wilbur that Shirley's deceased mother had been diagnosed with schiz-

ophrenia. However, documented evidence clearly shows that this supposed confession never took place. Nor is there a shred of reliable evidence that Shirley's mother had schizophrenia or any other psychotic disorder. Wilbur apparently allowed the phony confession to be inserted into *Sybil* to lend it more credibility.

Few topics in modern psychiatry arouse more controversy than MPD/DID. Many mental health professionals question whether the disorder even exists. According to these skeptics, MPD/DID is usually or always a socially created condition, fostered and reinforced in patients by suggestive therapists such as Wilbur. These skeptics contend that much of the supposed evidence for MPD/DID is based on shaky stories, weak methodology, and questionable data sources.

Sybil Exposed provides support for the skeptics; furthermore, the strange history of Wilbur and Sybil is by no means an isolated example. Like the House of Usher in Poe's Gothic masterpiece, the edifice of MPD/DID stands on cracked foundations and has been shaken again and again by scandal and strange doings. For instance, a leading MPD/DID researcher, Bennett Braun of Rush-Presbyterian Hospital in Chicago, was sued by a string of patients in the mid-1990s after he diagnosed them with MPD/DID and convinced them that they were members of Satanic cults. The story of Braun and his bizarre approach to psychiatry was unforgettably depicted in *The Search for Satan*, a PBS *Frontline* documentary by award-winning director Ofra Bikel.

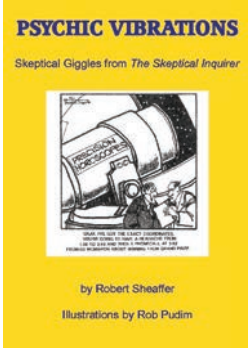
The sad and twisted events presented in *Sybil Exposed* and *The Search for Satan* illustrate why many mental health experts are skeptical regarding MPD/DID. This raises the point of whether this questionable disorder, repeatedly associated with fraud and charlatanry, should be listed in the *Diagnostic and Statistical Manual* (DSM) of the American Psychiatric Association, the so-called bible of psychiatry. The time has probably come to remove MPD/DID from the main part of the DSM and exile it to the special appendixes reserved for experimental, controversial, or culture-bound diagnostic categories.

When MPD/DID is relegated to psychiatry's back pages, professionals fascinated with the disorder can still study and discuss it to their hearts' content. Or perhaps it will eventually disappear into the twilight, to be remembered only as the specter of an embarrassing Gothic episode in the history of psychiatry.

James M. Wood is professor of psychology at the University of Texas at El Paso.

A Droll Stroll Down Skeptical Lane

JAMES UNDERDOWN



Psychic Vibrations: Skeptical Giggles from the Skeptical Inquirer. By Robert Sheaffer with illustrations by Rob Pudim. CreateSpace, 2011. ISBN 978-1463601577. 332 pp. Paperback, $19.95.

Readers of this magazine or skeptical literature in general might be a bit leery of a book claiming to tackle topics as varied as UFOs, cryptozoology, psychics, alternative medicine, and doomsday predictions. What encyclopedic magnum opus could hope to scratch the surface of such massive scope? Where could one possibly expect to find early musings about Uri Geller on one page and a report on the mermaids of New Guinea the next? Fear not, skeptics, for the answer lies not in a burdensome tome that doubles as a soporific—it lies in *Psychic Vibrations* by Robert Sheaffer.

"Psychic Vibrations" is also the name of a regular SKEPTICAL INQUIRER column that has been running since 1977. Sheaffer has been its sole and official author since 1980 and continues to write it today. The book, *Psychic Vibrations*, is a collection of the columns from 1977 to 1997, largely in their original form when they appeared in SI.

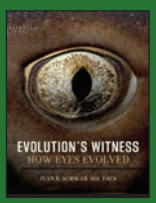
For me, an avid reader of SKEPTICAL INQUIRER since the late 1980s, this book was both an entertaining walk down memory lane and a source of new information about claims I'd either never heard of or forgotten about. For example, you might know that a guy named Kenneth Arnold gave rise to the term "flying saucer" after his UFO sighting in 1947. But were you aware that Arnold believed that invisible (UFO-borne) entities entered his house? (That's what he said: "I was aware of their presence because I could

[NEW AND NOTABLE

Listing does not preclude future review.

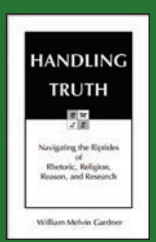
BANG! How We Came to Be. Michael Rubino. Through a series of beautifully illustrated pages, Rubino takes readers through a survey of early forms of life from the big bang to the present day. Prometheus Books, 2011, 69 pp., $17.

DEADLY POWERS: Animal Predators and the Mythic Imagination. Paul A. Trout. Foreword by Barbara Ehrenreich. In this exploration of the origin and function of storytelling, Trout goes beyond the work of mythologist Joseph Campbell to argue that mythmaking evolved as a survival strategy for coping with the constant fear of being killed by predators. Prometheus Books, 2011. 326 pp., $26.

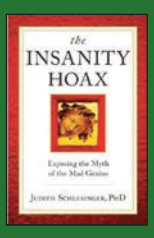


EVOLUTION'S WITNESS: How Eyes Evolved. Ivan R. Schwab. A professor of opthalmology (University of California–Davis) provides the story of the evolution of the eye (via at least ten different designs and countless morphological varieties), which he calls evolution's greatest gift and its greatest triumph. Oxford University Press, 2012, 336 pp., 400 illus., $75.

EXTREME PARANORMAL INVESTIGATIONS. Marcus Griffin. Griffin, a ghost-hunting witch, searches for ghosts in the American Midwest using everything from psychics to Ouija boards; skeptics might enjoy spotting the rampant logical fallacies and critical thinking errors in this (unintentionally) hilarious book of "real-life investigations." Llewellyn, 2011, 240 pp., $15.95.



HANDLING TRUTH: Navigating the Riptides of Rhetoric, Religion, Reason, and Research. William Melvin Gardner. The author demonstrates that the tests of truth emerged and are defended within the boundaries of four distinct domains of intellectual inquiry, each offering completely different tests of truth. This helps us understand, he says, why widely accepted truths (and the people who accept them) often do not, and cannot, agree. Logica Books, 2012, 198 pp., $12.95.



THE INSANITY HOAX: Exposing the Myth of the Mad Genius. Judith Schlesinger, PhD. The mad genius is a favorite cultural stereotype, yet there's no scientific proof that creative people are crazier than anyone else. Here a psychologist tracks the myth from its birth in ancient Greece to modern times. Shrinktunes Media, 2012, 225 pp., $24.95.

see my rugs and furniture sink down under their weight.") I wasn't. People see hard-to-identify objects in the sky all the time. Not so many see the furniture in their house sink, I would guess. That story, from the "Alien Antics" chapter, gave me a different and deeper perspective on Arnold.

Striking a tone of having fun with the stories without getting too snarky or mean is not easy for some skeptics. But the material here stays remarkably even-keeled in that way.

UFOs are Sheaffer's forte, but over the years he's deftly handled myriad other wild claims with wry aplomb. In a chapter entitled "Implausible Science and Medicine," we read about "psychic surgeon" (such individuals claim to reach into a body without making an incision or leaving a scar) Tony Agpaoa of the Philippines. Sheaffer's jab at the good doctor hits just the right note: "Inexplicably, when Agpaoa became ill, he sought treatment from conventional doctors, and not from other 'psychic surgeons.'"

Striking a tone of having fun with the stories without getting too snarky or mean is not easy for some skeptics. But the material here stays remarkably even-keeled in that way—even over the course of the almost twenty years the book covers. This is no small accomplishment for someone who's earnestly dealt with straight-faced wacky claimants for so long. I know only too well how tempting it is to lash out at an ornery believer every now and then, but Sheaffer doesn't succumb. He stays informative and funny.

The reader may feel something akin to nostalgia while poring through some sections. I smiled at late 1970s references to biorhythms, the movie *Amityville Horror*, and Uri Geller,

who in 1980 warned us that within fifty years the Soviets would be able to knock out U.S. radar with psychic ability. (I'll count that as a miss.) In a 1984 column, we are reminded of alleged psychic and healer Edgar Cayce's advice that "smoking in moderation to most bodies is helpful." Cayce's name hadn't crossed my eyes in years.

Sheaffer's decades on the skeptical scene give depth and perspective to some of these claims and cases. The "Doomsdays and Conspiracies" chapter jogs memories about older end-of-the-world predictions that have been recently resurrected. Many have forgotten that the Mayan calendar—which some think foretells the end of the world in December of 2012—was *supposed* to have ushered in the apocalypse on August 16, 1987. Oh, yeah…

This chapter also provides inside information on another trumpeter of the apocalypse, Harold Camping, whose 2011 predictions of the Rapture (May 2011) and Armageddon (October 2011) were in last year's news. This preacher-who-cried-wolf told the *San Jose Mercury News* that the dead would rise from their graves … in September of 1994. How many of Camping's followers would have believed him in 2011 if they'd known about him blowing the 1994 prediction?

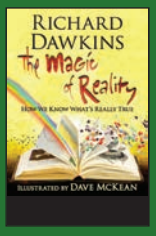
There is an advantage to waiting awhile to assemble a collection of work like this. You can tweak and comment on what was written years ago. Sheaffer does this in two ways: In a few instances, he restores material to columns that were shortened by SKEPTICAL INQUIRER Editor Ken Frazier for the magazine. He also drops in an occasional post script to clarify, correct, or add to a story for which additional information has become available. His personal experiences with many of his subjects serves him well here.

Rob Pudim's funny illustrations are sprinkled throughout the book. They appeared with the original columns and so give extra flavor to the adjacent stories.

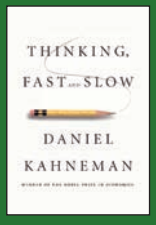
I will keep my copy of *Psychic Vibrations* both as a quick reference guide to the people and events who shaped the skeptical world over the last thirty years and as light humorous reading that can be enjoyed anytime.

James Underdown is executive director of the Center for Inquiry–Los Angeles and chair and founder of the Independent Investigations Group.

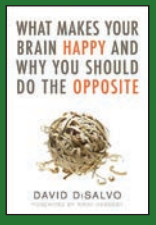
JEEPERS CREEPERS: Canadian Accounts of Weird Events and Experiences. John Robert Columbo. A prolific writer about Fortean Canadiana offers about forty (allegedly) true tales of the weird and supernatural; interesting, but favors anecdote over any critical analysis or investigation. Dundurn Press, 2011, 240 pp., $19.99.



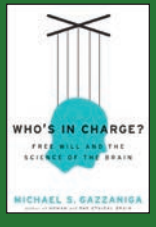
THE MAGIC OF REALITY: How We Know What's Really True. Richard Dawkins. Illustrated by Dave McKean. In his first book for young people, famous evolutionary biologist and science communicator Dawkins teams with award-winning illustrator McKean to clearly explain a wide range of natural phenomena and beautifully evoke the poetic magic of science (the magic of reality, which helps separate fact from myth). Free Press, 2011, 271 pp., $29.99.



THINKING, FAST AND SLOW. Daniel Kahneman. The influential psychologist and 2002 Nobel laureate in economics engagingly summarizes a lifetime of innovative study and pioneering experiments (many carried out with the late Amos Tversky) into the biases we all share in our intuitions and thinking, all of which shape judgment and decision making. Farrar, Straus, and Giroux, 2011, 499 pp., $30.



WHAT MAKES OUR BRAIN HAPPY AND WHY YOU SHOULD DO THE OPPOSITE. David DiSalvo. Foreword by Wray Herbert. The former editor in chief of *Psychology Today* reports on the paradox that much of what makes our brains happy leads to errors, biases, and distortions and describes how we can turn that awareness into more constructive action. Prometheus Books, 2011, 309 pp., $19.



WHO'S IN CHARGE? Free Will and the Science of the Brain. Michael Gazzaniga. An neuroscientist tackles the age-old issue of free will versus determinism using research from psychology and neurology. Harper Books, 2011, 260 pp., $27.99.

—Kendrick Frazier and Benjamin Radford

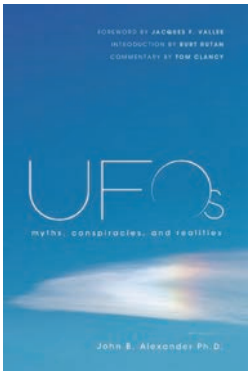
UFOs? Yes. Crashes and Conspiracies? No.

ROBERT SHEAFFER

A lot of people in UFOlogy today admit to being confused by Colonel John B. Alexander, a Green Beret combat veteran of the Vietnam War and former consultant to many intelligence organizations. Is he pro-UFO, anti-UFO, a member of the cabal of the New World Order, or does he espouse plain-old government disinformation? At the 2011 MUFON Symposium, Alexander's talk was jeered by a large segment of the audience when he dared to deny all government conspiracies, all claims of government "silencing" or harassment, and even Holy Roswell itself. Yet he also said that UFOs were real and probably interplanetary. Exasperated, he closed his talk by proclaiming that the UFO community had become "its own worst enemy."

To help us figure him out, Alexander has written a new book, *UFOs: Myths, Conspiracies, and Realities*. Clearly intended to be taken seriously, it boasts a foreword by Jacques Vallee, a commentary by Tom Clancy, and an introduction by Burt Rutan. It looms above Leslie Kean's recent best-selling *UFOs: Generals, Pilots, and Government Officials Go on the Record* (see my review in SI, March/April 2011), which is little more than an uncritical rewrite of well-known UFO cases that ignores all published skeptical explanations and commentary.

Alexander describes the paranormal side of his career in military science and intelligence. Newly graduated from the army's Command and General Staff College, he already had a strong interest in UFOs and psi. He wrote the article "The New Mental Battlefield," which was published in the December 1980 issue of that college's journal *Military Review*. The article covered the use of remote viewing, psychokinesis, and so forth in military applications. A copy of his article found its way to the celebrated columnist Jack Anderson, who wrote a *Washington Post* article about "The Voodoo Warriors of the Pentagon." Alexander also became involved with the Army's Task Force Delta, now better known because of the 2004 Jon Ronson book and subsequent film *The Men Who Stare at Goats*. He later moved on to INSCOM, the U.S. Army Intelligence and Security Command, where, concerned about possible Soviet use of psychic powers, he studied not only remote viewing but firewalking, orgone energy weather modification, and other weird stuff.



UFOs: Myths, Conspiracies, and Realities. By John B. Alexander. Thomas Dunne Books, New York, 2011. ISBN 978-0-312-64834-3. 336 pp. Hardcover, $25.99.

Clearly intended to be taken seriously, [the book] boasts a foreword by Jacques Vallee, a commentary by Tom Clancy, and an introduction by Burt Rutan.

UFOs were among the things that Alexander was supposed to study at INSCOM, but there was a dilemma. Everybody "knew" that there was supposed to be a black ops UFO program somewhere in the government, but none of these high-ranking intelligence officers knew anything about it. In the course of his work and travels, Alexander met with officials from Area 51, the Lockheed Skunk Works, four-star generals, physicists Harold Puthoff and Edward Teller, the CIA and the NSA, NORAD, the Defense Intelligence Agency, and the Strategic Defense Initiative. In the course of these discussions, Alexander would at some point discreetly raise the question of UFOs. To his great surprise, he did not get the expected "back off" response (which he was sometimes given in other contexts) but instead an expression of genuine interest and puzzlement as well as support. "The offer of assistance by one suspected of hiding a UFO project [a deputy director of the CIA] was just one of many examples in which help was given in my search for a black program … when you are deflecting a person from a black program, you don't provide them with assistance that could expose the project you want to protect." He summarizes all these meetings: "Even at the most senior levels, some officials shared the conventional mythology of the general population regarding UFOs. Despite their high-level positions, they all seemed to think that someone else was responsible for the

topic." This probably explains the presence of intelligence operatives in the National Investigations Committee on Aerial Phenomena (NICAP) and other UFO organizations: they have been reading the same UFO books as everyone else, found no projects of the kind inside government, and so continued their search for UFO information in outside groups. Alexander concluded—correctly, in my view—that there was no government or military agency dealing with UFOs and no cover-up.

This places him in a very difficult position with respect to his fellow UFOlogists, for most of whom the UFO conspiracy is paramount. Alexander met with Lieutenant Colonel Phillip Corso just before the publication of the latter's bestselling *Day After Roswell* (1997), which claimed that much of present-day high technology was reverse engineered from the Roswell saucer. But no conspiracy means no ET crash, so nothing would come on the "day after" nothing. He notes that "discrepancies quickly emerged" in the book and that "errors abound, both minor and egregious." Yet Alexander respects Corso, praising his "illustrious military career" while reserving his true scorn for the skeptics: Condon, Sagan, and Klass among others. Alexander, who lives in Las Vegas, wandered over one year to check out the James Randi Educational Foundation's Amazing Meeting and was somewhat shocked by the overt promotion of atheism (especially by Penn Jillette), which he attributes to skeptics being "true believers" in atheism (or true unbelievers, I suppose).

The book contains a chapter of "Real Cases and Hard Data" that he considers "high strangeness and high-credibility." This list, however, is pretty much the same as other UFOlogists'—minus the saucer crashes. He is impressed by the ridiculous photo hoaxes of Gulf Breeze, even though the hoaxer's model has been found and an accomplice has confessed. He is very big on the Rendlesham Forest, United Kingdom, "UFO landing" case of 1980 and has nothing but scorn for skeptic Ian Ridpath's careful item-by-item analysis of this very complex case (see www.ianridpath.com/ufo/rendlesham.htm; Alexander clearly has not).

I goaded Ridpath into challenging Alexander over some of the statements in this book about Ridpath's analysis that were demonstrably wrong. I thought that Alexander would see the error and perhaps start to back away from Rendlesham. It was a waste of time, Ian said, but he agreed do it. Ian was right: Alexander replied only that he had personally interviewed the major witnesses and is convinced they are credible. I questioned Alexander: "Aren't you troubled by how much their stories have changed since they were first written down?" Apparently not: Alexander replied that we must agree to disagree. Like most of those who proclaim the urgent need for science to study UFOs, Alexander is reluctant to look too closely at the pillars supporting the beliefs he proclaims, probably for fear of having them crash down.

I questioned Alexander: "Aren't you troubled by how much their stories have changed since they were first written down?" Apparently not: Alexander replied that we must agree to disagree.

Significantly, Alexander heaps scorn on the 1999 Committee for In-Depth Studies (COMETA) report from France that "was given the trappings of an official study, when in fact it was conducted by members associated with [France's Institute of Higher National Defense Studies (IHEDIN)], a private think tank." The COMETA report, containing supposedly unexplainable UFO cases that have been validated by experts, is what seduced the political activist reporter Leslie Kean into UFOlogy (Kean calls the report "an extraordinary new study by former high-ranking French officials"), and she waxed rhapsodically about its effect on her and her career: "It was hard for me to let it go . . . [it] radically changed the course of my career as a journalist." Alexander charges that "the bibliography of the [COMETA] study contains a long list of popular books that would be well-known to those who read the UFO literature. A concern should be that this panel appears to have given scientific credibility to those publications. . . . In fact, the COMETA Report was published in a tabloid, and proved to be an embarrassment to IHEDIN, which is a highly respectable organization." He fumes, "the [COMETA] Panel accepted Roswell as a real event and believes that United States has been hiding the information. . . . Senior officials from several governments were willing to make serious judgments about both the nature of UFOs, and the involvement of the U.S. Government based on unsubstantiated data from questionable sources." Take that, Leslie Kean!

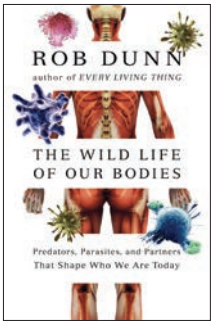
So we are left with a UFO book by a retired American intelligence officer who is willing to critically examine some UFO claims, especially if the claim portrays the U.S. government or military in a bad light, but is unwilling to critically examine others. Still, the book is worth reading for the insights it provides on how secret projects within the defense establishment do and do not operate. He also explains why UFOs will invariably be like the proverbial "tar baby" for any government official: messy, sticky, and impossible to put down once you have picked it up. "Disclosure has already happened," says Alexander, citing ambiguous statements by world leaders like Jimmy Carter and Prince Philip. If he's right, the government knows even less about UFOs than we do.

The Case for Aggressive Evolutionary Science

KENNETH W. KRAUSE

Why is it so bloody important that nonscientists understand the basic facts of evolution—or at least of natural selection? It isn't just a matter of enforcing pre-historical accuracy, of course. And contrary to what many of our secularist colleagues apparently believe, the point is not merely to relegate literalist religion to its dark and dismal place.

Evolutionary science is critical here and now—in rural America, for example, where more than a third of us have grown morbidly obese and can't seem to figure out why, much less how to solve the problem. It matters in big cities, too, where trusted healthcare professionals—also nonscientists, by the way—mistakenly assume that cleaner is always better. Indeed, evolution is important worldwide, as previously insulated human populations expand and instinctively xenophobic cultures clash.


ROB DUNN
author of EVERY LIVING THING
THE WILD LIFE OF OUR BODIES
Predators, Parasites, and Partners That Shape Who We Are Today

The Wild Life of Our Bodies: Predators, Parasites, and Partners that Shape Who We Are Today.
By Rob Dunn. HarperCollins, New York, 2011.
ISBN 978-0-06-180648-3. 290 pp. Hardcover, $26.99.

In *The Wild Life of Our Bodies*, biologist Rob Dunn describes a fascinating yet genuinely alarming suite of evolutionary mismatches between our primeval biology on the one hand and our swiftly advancing culture on the other. To what effect? "The more we distance ourselves from our evolutionary history," he contends, "the more we seem to feel the pull of uncut strings."

But the ensuing tangle is more complicated than the brand of vague despondency that typically inspires middle-aged tax attorneys to fire up the RV for a quick "back-to-nature" campaign through the Black Hills of South Dakota. Far more seriously, Dunn says, extrication from our proper ecological context has triggered a novel barrage of truly challenging maladies—everything from allergies, diabetes, and heart disease to autism and a host of social disorders.

According to Dunn, recent studies show that the antibiotics contained in hand sanitizers and soaps, for example, provide no benefit in terms of disease prevention. … Life expectancies in developed countries have increased for decades—but in some ways we have also grown sicklier.

As health-conscious circles expand in the developed world, many now recognize the basic relationship between evolution and weight control (or, more accurately, body composition). Familiarity with the diets and habits of our Pleistocene ancestors notifies us that two features of our current lifestyle—a surplus of rich, easily digestible food and absurdly relaxed exercise habits—have left us so overstuffed (yet undernourished) that we've had to redesign our doorways, office chairs, elevators, airplane seats, and, unsurprisingly, our hospital beds.

But few of us appreciate the immense nutritional impact of our microbiomes. For instance, *Bacteroides thetaiotaomicron*—one of many species of microbe native to our guts—churns out at least 400 vegetable-processing enzymes that humans would otherwise lack. These creatures allow us to extract thirty percent more calories from our food, for better or worse; and absent their beneficent presence, we couldn't possibly produce sufficient quantities of vitamins B or K, the latter of which permits blood coagulation.

Yet we persist in attempting to create "germ-free" environments. According to Dunn, however, recent studies show that the antibiotics contained in hand sanitizers and soaps, for example, provide no benefit in terms of disease prevention. Unfortunately, they do initiate the evolution of antibiotic resistance, and they do furnish a warm, open house for bad bacteria once they kill the good ones. "Our frequent use of antibiotics," the author warns, "will progressively make each bit of food less nutritious and give each pathogen to which we are exposed a better chance of taking over our body."

Life expectancies in developed countries have increased for decades—but in some ways we have also grown sicklier.

Exceedingly rare prior to 1950, Crohn's disease, for example, now afflicts 600,000 people in the United States alone. Marked by obnoxious and persistent symptoms associated with immune system attacks on the gut, Crohn's has also lately emerged in rapidly modernizing regions of India and China.

Scientists have proposed various causes for these disturbing trends. Pollution, toothpaste, refrigerator bacteria, and hypochondria have all been blamed for Crohn's insurgence. But in 1995, University of Iowa medical researcher Joel Weinstock began to reflect upon the tendency of contemporary, affluent societies to disfavor certain species, including those helpful to humans.

While nearly half of all U.S. children had gut worms into the 1940s, almost none possess them now. Weinstock wondered whether humans had begun to "miss" the so-called parasites with which we evolved—so much in fact that our guts never learned to properly function without them. And just maybe, he thought, the antihelminthics we take to kill the worms—like antibiotics and antiseptics—aren't all they are commonly cracked up to be.

In 1999, Weinstock received permission to perform an experiment on twenty-nine Crohn's patients. Each was given a glass of Gatorade spiked with nematodes—pig whipworm eggs, specifically. In less than six months, all but one patient were feeling better, and twenty-one of the remaining twenty-five were in remission (four had dropped out along the way). Re-wilding their guts, according to Dunn, had "cured sick patients who had previously little hope of getting better."

How so? At this point no one knows for sure. Weinstock thinks that gut worms, which in many cases are both tolerable and insurmountable, induce our immune systems to partially acquiesce in order to save precious energy. As such, they also prevent various immune responses from launching heightened and prolonged attacks that can easily result in serious damage. Our worms, in other words, initiate a valuable intestinal peace.

By contrast, Dunn emphasizes certain compounds produced by many species of gut worm that mimic those created by our own cells. In so doing, they might signal and to some degree suppress the immune system. Perhaps our immune system evolved, the author infers, to deliver a stronger response than otherwise appropriate because our bodies "assumed"—and continue to assume—the presence of parasite-generated suppressive influences. In short, modern immune systems run amok by overcompensating for these teensy-weensy wriggling ghosts of the past.

Emotional disgust evolved, Dunn vies, as an effective means of isolating ourselves from disease-related stimuli.

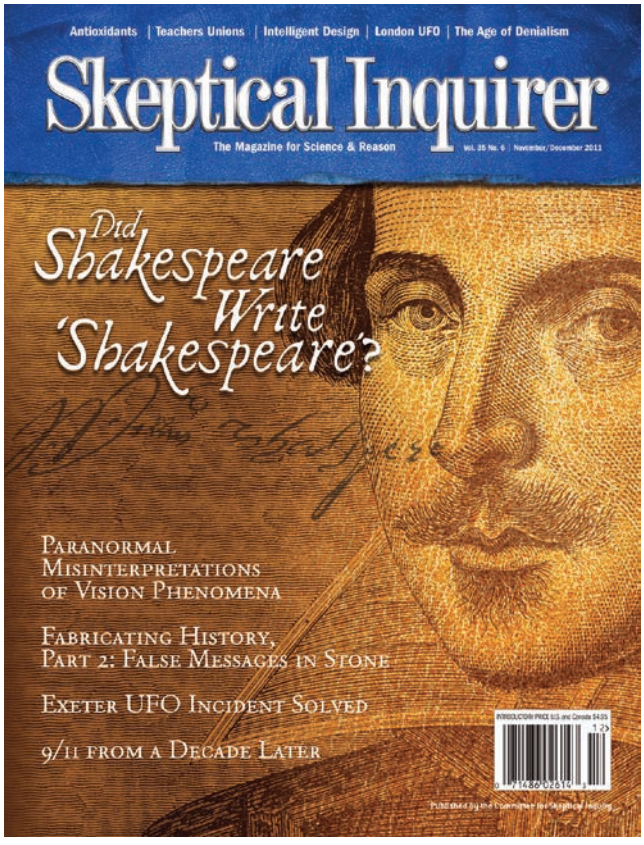
Either way, the "hygiene hypothesis" generally predicts that countless people could benefit—in some cases enormously—from the corporeal reintroduction of mutualist species that most practitioners of modern medicine still consider "dirty." But the "old medical model," Dunn argues, "in which we just scrub the rest of life off our bodies, is wrong." A deeper, more respectful grasp of evolutionary science, it seems, could go a long way toward that model's long-belated renovation.

In recent years, researchers have begun to inquire whether humans possess a *behavioral* immune system as well—one that in the past may have helped us to avoid disease but now leads to inapposite feelings of disgust, and perhaps ultimately to collectivism, xenophobia, and even war. Emotional disgust evolved, Dunn vies, as an effective means of isolating ourselves from disease-related stimuli.

But the instinct was imperfectly honed. Clearly, subconscious disgust can cause us to shun the aged, the disabled, and carriers of noninfectious diseases such as obesity. But some scientists now speculate that, especially in less educated and connected societies, it can steer us toward tribalism, the rejection of liberal democracy and free enterprise, and violent clashes between seemingly incompatible cultures.

Many, including me, were drawn to evolutionary science because of its explanatory power—its intensely satisfying "aha!" moments. But as Dunn's new book makes very plain, the discipline's practical applications are far more valuable. Yes, certain ideological factions continue to resent speakers, writers, and educators who assertively "push" evolution on society. The truth may not be enough for them, but the health and survival of the species should be.

Kenneth W. Krause is a contributing editor and science news columnist for Skeptical Inquirer. He may be contacted at krausekc@msn.com.


Antioxidants | Teachers Unions | Intelligent Design | London UFO | The Age of Denialism
Skeptical Inquirer
The Magazine for Science & Reason
Did Shakespeare Write 'Shakespeare'?
Paranormal Misinterpretations of Vision Phenomena
Fabricating History, Part 2: False Messages in Stone
Exeter UFO Incident Solved
9/11 from a Decade Later

Our November/December 2011 issue generated more reader response than any other in the past couple of years. Most letters were about the cover article on Shakespeare and a column on teachers unions (the latter appear in Follow-Up, page 46), but many other topics stimulated responses as well. We can give only a sample here but thank all who wrote.

—EDITOR

Did Shakespeare Write Shakespeare?

Joe Nickell's article "Did Shakespeare Write 'Shakespeare'?" in the November/December 2011 issue provided a very useful survey of this wiggy corner of pseudo-scholarship. However, as Kendrick Frazier points out in his News and Comment article "The Age of Denialism" in the same issue, no mere display of facts will ever convert the Oxfordians or Baconians into Stratfordians because their reasons for belief are psychological and social, not rational. So just how should the skeptic confront these and other denialists? Frazier failed to mention one of the most powerful tools in the skeptic's toolbox: parody, a weapon Voltaire and Swift were expert at wielding.

I remember reading a delightful article a number of years ago in which the author, using the tactics of the Baconians, purported to prove that George Bernard Shaw could not have written his plays. The author mirrored the arguments used by the anti-Stratfordians, citing Shaw's deficient formal education and his animosity towards schools and teachers, his humble beginnings, etc. He then applied a ludicrously convoluted decryption algorithm to a Shavian passage. Out popped the message: "This play was written by Winston Churchill."

Jet Foncannon
bolu.bolu@verizon.net

Joe Nickell's article on the authorship of "Shakespeare's" plays is up to Nickell's customary high standards of investigation and clear writing. But I think that the fundamental flaw of the anti-Stradfordian claims can be put more succinctly than he does. It's an elementary logical gaffe; namely, passing off your *conclusion* as a *premise*. This sort of fallacy is starkly seen in something like Mark Twain's assertion that Queen Elizabeth I must have been a man, because no woman could have said and done the things Queen Elizabeth I said and did.

More than that, though, I'd like to recommend to Nickell and his readers *Contested Will*, the wittily titled recent work by James Shapiro. When Shapiro is through setting out the history of the various anti-Stradfordian claims and turns to actual scholarship, the change in the whole atmosphere is stunning. After the wire-drawn "reasoning" of the anti-Stratfordians, it's a blast of fresh air to learn, as scholars know, that playwrights of that period didn't publish anything: they sold a play to a company of players (£5 was the going rate—that at a time when a single costume might cost £10); publication was a further way for the players' company to make some more money. Published plays were often anonymous; it's only by chance that we know that Marlowe wrote *Tamburlaine*, and several of the best published plays of the period are without known authors to this day. A playwright had to know a lot about the players on hand, too: either Marlowe in exile or the 17th Earl of Oxford would have been mad to pen a play like *Much Ado About Nothing*, in which Rosalind's lines come to almost a third of the whole play, unless he knew for a fact that a (boy!) actor was on hand who could creditably handle any such thespian burden.

There is much more; it's a fascinating book, and, in addition to the fact that it's well written, the sanity of real scholarship in such an arena is hard to overpraise.

Andrew L. Sihler
Portland, Oregon

Thank you, Joe Nickell. Hopefully your article will, at last, put to rest all the silly speculation on who wrote the works of Shakespeare.

In his role as theatre director Jonathan Miller was frequently asked if he thought it was actually Shakespeare who wrote the plays, and his stock answer was "It could have been somebody else with the same name."

Jim Cranwell
Whitby, Ontario, Canada

Isaac Asimov commented that Shakespeare made so many mistakes in his astronomy/cosmology (not that he ever used those words) that the plays could not have been written by Francis Bacon, who was an expert on sixteenth-century science. For example, Shakespeare wrote several times that each fixed star had its own sphere.

Most members of the anti-Shakespeare crowd are elitists, such as Enoch Powell, who said that no one who wasn't intimate with royalty could write so well about their relationships. Of course, anyone who has participated in a social organization, service club, or guild knows a lot about naked ambition and greed for power.

Somebody, tongue in cheek, said that Marlowe was not killed in the brawl but was spirited away to save him from a Spanish hit squad, and scholars have ever since listened for the sound of typing coming from an anonymous Elizabethan tomb.

Howard F. Heller, MD
Seattle, Washington

I liked Joe's article on "Did Shakespeare Write 'Shakespeare'?" but I think he missed an opportunity by not reporting about the stylistics analyses that have been made at Amherst College in Massachusetts and other places (see www.umass.edu/newsoffice/storyarchive/articles/39476.php).

Apparently there is at least one poem that was not Shakespeare's but the major plays are his.

Don Bollenbacher
Huntsville, Alabama

I was disappointed in reading Joe Nickell's article. There are schol-

ars and other experts who have doubts concerning Shakespeare's authorship and with good reason. To arbitrarily consign these scholars to a "looking-glass world" is to do them a disservice. I found it interesting that Nickell cites the code experts William and Elizabeth Friedman for their work in repudiating Elizabeth Gallup's attempt at decipherment. However, he fails to mention that the Friedmans also had their doubts about Shakespeare. The fact remains that we may never know for certain if Shakespeare did indeed write Shakespeare. Nickell usually writes unbiased and objective articles so I will give him a pass on this one.

Jim Murray
Simi Valley, California

As a skeptic and staunch supporter of CSI, I have no problem with a critical examination of the "anti-Stratfordian" position on the Shakespeare authorship issue. But Joe Nickell and Editor Kendrick Frazier ("From the Editor," p. 4) offer, instead, little more than sneering ad hominem ridicule (equating all anti-Stratfordians with UFO cranks), while ignoring most relevant facts.

It is extremely implausible, some would say an extraordinary claim requiring extraordinary evidence, to suppose that a middle-class merchant and actor from Stratford, who may or may not have gone to a local grammar school, never traveled outside England, and died with no books to his name, wrote the works we know as those of "Shakespeare" (works pervaded by aristocratic perspectives and sensibilities). Pseudonyms and ghostwriters have been common throughout literary history. It is hardly "bizarre" (as Frazier flippantly suggests) to suppose that a conventionally credited author "didn't actually write the plays and poems attributed to him."

Nickell invokes Occam's Razor, but the simplest explanation is that the author of these works was an aristocrat himself with the resources and opportunity to travel widely, spend many years obtaining a highly sophisticated classical education, and purchase a large number of books (expensive items in those days) that were obvious and essential sources for the plays. Of course the author was a genius; the question is who is the most plausible genius to have actually written them? Nickell simply ignores the enormous mass of textual and historical evidence linking the works to events and persons in the life of a specific aristocrat, Edward de Vere, Earl of Oxford (a poet and patron of the arts praised under his own name by contemporaries for his literary skill). Instead, Nickell wastes time knocking down easy straw men like the long-discredited "Baconian" and "Marlovian" theories.

Nickell accuses anti-Stratfordians of "start[ing] with the answer they want and work[ing] backward to the evidence." He also, contradictorily, complains that it took hundreds of years for critics to develop serious doubts about the conventional view and to zero in on Oxford as the likely author, a conclusion that only emerged after a diligent English schoolmaster, with the easily ridiculed name of J. Thomas Looney (still more *ad hominem* cheap shots!), puzzled over the mass of available evidence and arrived at the Oxfordian hypothesis in 1920. Nickell's accusation is ironic as well as false because he himself seems to start from the premise that the received orthodox view must be true—odd indeed for a professional skeptic.

So who are the real skeptics here? I side with the Oxfordians.

Bryan H. Wildenthal
Professor of Law
Thomas Jefferson School of Law
San Diego, California

Joe Nickell responds:

The letter writers who understand that Shakespeare wrote "Shakespeare" are obviously engaging in critical thinking. Modesty prevents me from commenting on some of their compliments except to offer sincere thanks for them.

I must protest, however, that I did not—by any stretch of the imagination—"arbitrarily" consign the anti-Stratfordians to a looking-glass world. They traveled there on their own. May I ask anyone who thinks otherwise to please reread my brief history of the silliness. I understand that cranks and conspiracy theorists want to be treated with all the respect due legitimate scholars, but to do so would be to pretend they are what they are not. If any apology is due, however, I will offer one: I'm sorry that they are cranks.

Now, Bryan H. Wildenthal's assertion—that it is "extremely implausible" for a non-aristocrat to have written the works of Shakespeare—is the unfounded foundation upon which the crumbling edifice of anti-Stratfordian pseudoscholarship is assembled. Wildenthal's attempt to reverse the burden of proof thus falls on his head, and his byplay with Occam's Razor ends up nicking him in the process.

That'd Be Quite a Conspiracy

I read with amusement the article "Civilizations Lost and Found" (September/October and November/December 2011 issues); the documentary *The Lost Civilizations of North America* implied that modern public (Americans') ignorance of the ancient American mound-building societies is a conspiracy of silence. It has been reported for years that the general public in America is quite deprived of common knowledge, such as failure to name the capital of Canada or to locate another state or country on the map, let alone knowledge of Native American ancient culture. So instead of reasons of indifference, disinterest, or apathetic attitude toward anything except people's own immediate environment, it is because of conspiracy! A conspiracy to keep the general public ignorant, which could date back for decades! A vast organization that includes academic, media, school, and civic societies (and government of course) all conspired to keep knowledge from Americans for years! And no one ever blogged/Facebooked/ tweeted about it? Truly shocking!

Mio Sam Lao
Princeton, New Jersey

The Exeter Incident

I read with interest James McGaha and Joe Nickell's in-depth investigation of the legendary Incident at Exeter (November/December 2011). They have come up with a probable solution to at least some of the sightings involved, although it is hard to believe the "KC-97 refueling plane" hypothesis would apply to the string of sightings mentioned. As a former Air Force officer (in charge of UFO Blue Book sightings for an airbase, no less!) I feel that McGaha and Nickell may have overlooked an important aspect of the sightings—no noise. Although no noise was associated with the sightings in the article, when you consider that the KC-97 tanker was one of the largest, most powerful piston-engined aircraft of its day, it's simply not possible that witnesses would not immediately recognize the sound of a plane overhead.

Based on a major upgrade of the famous B-29 bomber, the KC-97 was powered by four huge piston engines and many additionally had two J-47 jet engines tucked under the wings. If the KC-97 tanker aircraft was refueling at the time, it would have been under full power in order to keep up with the all-jet B-47 bomber being refueled. That's a total of four large piston engines and eight jet engines for the two planes—a significant source of aircraft noise that would be detectable from all but high altitudes. If, however, the aircraft were refueling at a low altitude, the noise would easily thunder across the ground below, and the planes would only be in view for a quick pass overhead. Note, however, refueling was almost always done at moderate to high altitudes to cut fuel consumption and for added safety in calmer air. The signal lights on a KC-97 are not ultra-bright flood lights that would night blind the B-47 pilot and the refueling crews.

Also, while the planes would have been at 10,000 feet or more, I doubt they could have presented the terrorizing threat as experienced by the police officer and the teenager. These aspects of the sightings don't seem to add

up, for me at least. It is hard to envision a refueling scenario that might account for the eyewitness descriptions.

So, while the fine details of the KC-97 solution seem to nicely fit the solution hypothesis, I believe the lack of noise and brilliant lights indicate that there may be more work to do on this case. I certainly don't have the knowledge or experience of McGaha or Nickell (both of whom are acknowledged top-notch experts in their fields), but I feel that these two items might be addressed before the case is marked, at long last, "closed."

Ralph McGeehan
Tinton Falls, New Jersey

The article on the Exeter UFO was interesting, but can I ask a question? The article says there was a B-47 refueling from a KC-97. Now the B-47 had six General Electric J-47 engines, and back then that was a loud engine, not like the quiet turbo fans of today. The KC-97L had four Pratt & Whitney R-4360 engines (loud also) plus two J-47s added; the KC-97 needed all that power so it could go fast enough (not slow moving) to keep the B-47 from stalling. The refueling was not at a high altitude, but around 20,000 to 25,000 feet, if that high. So why no comments about any engine noise or lack thereof? One could hear that combination of engine noise at least ten miles away as the planes were up high.

Elias J. Vujovich
Southington, Ohio

Exeter solved? Maybe not.

While it's hard for a ground-based observer to assess an aerial object's size and distance, the pilots of refueling craft must know their altitude very precisely.

Since refueling doesn't occur at tree-top levels, nor is the fuel boom deployed on takeoff and landing, it's probable actively fueling craft would be rather high—say, at least 5,000 feet. Actual altitude is not addressed in the article, yet it's critical to the case.

From the ground, it is difficult to distinguish two adjacent separate point sources of bright light at that distance, much less a forward-and-reverse five-light sequence. The entire craft would appear very much like a single light source.

The fuel boom does not oscillate wildly during deployment—that would be dangerous, and that's what the stabilizing wings are intended to prevent. At a distance of a mile, any controlled wobble in the boom would be unapparent and unlikely to be mistaken for a "falling-leaf" motion.

Nor would an apparently slow-moving mile-high light source, even a very bright one, be likely to scare a witness into a ditch for fear of impending collision.

Jon Hauxwell
Hays, Kansas

Joe Nickell and James McGaha respond:

The issue of noise is interesting. Allan Hendry, of the Center for UFO Studies, observed that in cases where aircraft are positively identified, "One of the leading causes of surprise is the inability of the reporting witness to hear any noise from the aircraft." Even in cases where advertising planes were identified with absolute confidence, he said, "Witnesses claimed that the planes were silent in 91 percent of the reports I received." (See Hendry's classic The UFO Handbook, *1979, pp. 34, 38–39.)*

Such apparent *silence is attributable to several factors, including the "weapon-focus effect" (mentioned in our article). As well, the lower-power setting of the B-47's engine (necessary for refueling) would render that plane much quieter than usual. Moreover, sound may be dampened by such factors as temperature, temperature inversions, prevailing air currents, air pressure, absorption properties of the surrounding environment, and other environmental factors. Of significance is the plane's distance from the observer and the low angular altitude—as we propose in this case—which provides more atmosphere for the sounds to pass through and more ground objects to reflect and absorb sound.*

The low angular altitude also very likely helps explain the illusion that the pane was flying close to the ground. This is consistent with a frightened witness reporting that the lights "would go down behind the trees, behind a house and then reappear." In addition, during refueling the KC-97 did not fly level but descended (to gain air speed).

Turning to the other issues, we calculate that the sequencing lights in question would indeed allow for the necessary resolution. As to the oscillation, an inexperienced pilot (as could be expected for a practice exercise) can often have trouble smoothly flying while connected to the boom, among other explanations.

Clearly, the best evidence consists of the red sequencing lights (flashing "one, two, three, four, five, four three, two, one"), as well as their 60-degree incline, and extreme brightness (rendering other features of the UFO indistinguishable from the ground). This, together with the fact that just such a plane can reasonably be placed where the UFO was, should leave little doubt as to its identification as a KC-97 refueling plane. To put this aside on the basis of the speculative issues raised—particularly regarding witnesses' behavior—would represent, we feel, a serious mistake in judgment.

9/11 Military/Industrial Complex

In their thought-provoking commentary "9/11: Perspectives from a Decade Later" (November/December 2011), Clark Chapman and Alan Harris state, "We are disappointed and puzzled that, a decade after the attacks, there has been minimal return to the status quo ante."

Their next sentence would seem to contain the answer they seek: "The Homeland Security infrastructure continues to grow." Put another way, there's gold in them there terrorist-infested hills.

When the Soviet Union collapsed in the '90s, I expected our military expenditures to lessen; they rose. "Follow the money" may be the best advice for explaining why things are they way they are, especially when billions and trillions are involved.

I'm disappointed that we sold our ideals to fear-mongers and security hucksters, and I wish we'd deal with the snake-oil salesmen appropriately for lying to us about what their elixirs will do. But my money's on the big money, until the military-industrial Bastilles get stormed.

Dave Suess
Hermosa Beach, California

The Age of Denialism

I applaud Kendrick Frazier's commentary on "the age of denialism" (SI, November/December 2011) about the resistance to scientific evidence among various denialist movements. Frazier notes that providing people who hold strong beliefs reliable information that undermines those beliefs causes them to cling to their positions even more rigidly, as they are based on causes rather than on evidence. He adds that this bias is an unconscious process in which cognitive dissonance filters out facts contradicting our views. A skeptical position—one of *inquiry and doubt*—should be an effective antidote to denialism. Yet, as Frazier noted, the term "skeptic" is sometimes usurped by deniers who are *hostile to inquiry* and *have no doubt* about the truth of their beliefs, refusing to consider evidence to the contrary.

One example of denialism not mentioned in Frazier's commentary involves the refusal to look at any evidence that some aspects of consciousness might not result entirely from physiological processes. It is far easier to deny the evidence for consciousness than to accept that the materialistic worldview is incomplete. However, the philosophical belief that all mental phenomena can be understood in terms of material particles and fields is incompatible with the data from contemporary physics in regard to the interaction of consciousness with mechanical processes.

Bruce Greyson, MD
Department of Psychiatry

and Neurobehavioral Sciences
University of Virgina

Kendrick Frazier replies: I appreciate your kind remarks about my article about denialism. I'm not sure, however, I share your view that consciousness should be placed in the same category as the other topics commonly subject to denialist arguments, nor that "materialistic" science is still not the best route to eventually understanding it.

UFO to IFO

I thought you might be interested in a UFO sighting that very quickly became an IFO sighting.

The sighting occurred in 1972 while my wife and I were living in a northern suburb of Columbus, Ohio. It was early fall and the weather had just turned cool. The humidity was very low and the sky was transparent. In short, it was a perfect night for stargazing. I had been an amateur astronomer for several years so I set up my six-inch reflector as soon as it got dark.

After several hours of looking through the telescope, I sat back and just looked up at the beautiful night sky. It was at this point that I saw a UFO. It was on a north-to-south path that took it almost over my location. I estimated that it was at a very high altitude and moving with extreme velocity. It was roughly circular in shape and had an overall orange glow. I had a pilot's license and so was familiar with aircraft lighting. This object was not displaying any standard aircraft lighting. I could detect no sound or exhaust. Its most interesting feature was that the orange glow was rhythmically pulsing.

At this point I thought that I had, after a number of years looking up at the night sky, finally seen a UFO. As I was wondering what to do about it, I saw two more UFOs. They were on almost the same path as the first. They were flying with one behind the other. I figured that if three objects had come by, perhaps there might be another one soon.

I didn't have long to wait. I spotted three UFOs on the north-to-south path but slightly off to the side of the previous objects. They were arranged in an arc with the middle object in the lead. I got my binoculars on them and they immediately became IFOs.

What was my IFO?

Well, the IFOs were Canada geese. Almost everything that I thought I knew was wrong. First, they were probably no more than 100 feet overhead and traveling at a sedate goose speed. I should have figured out the orange glow. Our community had recently installed low-sodium vapor street lights. On overcast nights the clouds had an orange glow. The gray geese made a good reflector for the street lights. The pulsing also became apparent. When a goose's wings were either above or below the horizontal, they didn't reflect light to my eye. When they were horizontal the cross sectional area of the goose was much greater and so the reflected light intensity was also greater. The goose was not getting brighter and dimmer. It was getting larger and smaller.

I had assumed that the object was a solid body and so the change in light intensity was seen as a pulsating body. Once I knew what I was looking at, I was able to see the next IFO was changing size as it flew by.

I suppose that the early fall and north-to-south path should have brought to mind migrating waterfowl. Even if it had, I doubt that I would have accepted that solution without seeing it with my own eyes.

Ron Saunders
Montgomery Village,
Maryland

Very instructive. Many UFO sightings are indeed now thought to be due to reflections off flocks of birds, and even swarms of insects.

—EDITOR

The Perpetual Quest

Regarding "The Perpetual Quest" (September/October 2011): years ago, when I worked for IBM's STD (Storage Technology Division) as test engineer, I thought to make a test and devised a perpetuum machine, which I offered to the facility manager as an improvement proposal to save energy.

The "invention" consisted of a chain of empty cans moving between two wheels like a belt saw. One leg of the chain moves through a basin of water, sealed with a hose to prevent the water from leaking.

As soon one can enters the water out of the hose from below, the buoyancy will push it to the surface of the water. At the same time, the next can is drawn into the basin to repeat the cycle.

I added a sketch and a formula. I also recommended a brake to prevent an attached generator from overload and using mercury would increase the power twenty-seven-fold. I didn't tell that the down drag is always larger than the buoyancy.

After three weeks I became nervous because no rejection had arrived. What if a first-level or, worse, second-level manager ordered this machine to be built?

Instead I got a call from a facility engineer asking how I would seal the cans in the hose. I explained to that guy that this proposal was intended as a joke and beseeched him to reject that proposal.

Two weeks later another facility guy called and asked me to explain to him the formula! I told him that the formula contains an error and was able to convince him (I think) that this perpetuum mobile won't work.

This was a lesson to me.

Heinz F. Lenk
lenkh@uni-mainz.de

Dowsing Belief

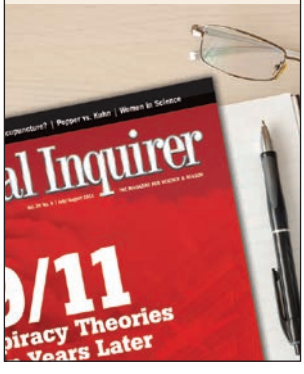
As someone who works in the field of underground detection, I can confirm Benjamin Radford's assertion from his Skeptical Inquiree response (September/October 2011) that belief in dowsing is peculiarly persistent, even in official capacities.

My colleagues and I use electromagnetic instruments to detect subsurface utilities and other items of interest in support of future remediation or construction efforts. Once while locating utilities on several gas stations, my coworker and I discovered that the local, publicly funded "One-Call" water-service markouts were sometimes wildly inaccurate. When we offhandedly mentioned this to the gentleman performing the public telephone service markout, he responded by asking, "You know how that guy locates?" He then held his fists up at chest-level and slowly turned them toward each other. The man marking the water service was using good ol' fashioned witching sticks, obviously ineffectively, to detect sensitive utilities in the hopes of avoiding them during excavation operations. Imagine how much damage can be done and expense spent under these circumstances, not to mention the potential loss of life if such procedures are used to "find" natural gas pipelines.

Russ Dobler
Tarrytown, New York

[FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words.** Due to the volume of letters we receive, not all can be published. Send letters as email text [not attachments] to letters@csicop.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122, or fax it to 505-828-2080.



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[THE LAST LAUGH

BENJAMIN RADFORD

SKEPTICAL ANNIVERSARIES

by Tim Farley

March 1: In 1692, the first accused in the Salem Witch trials are brought before magistrates for interrogation.

March 4: In 2002, Holocaust denier David Irving declares bankruptcy after losing a libel suit against Deborah Lipstadt and her publisher.

March 13: In 1997, a spate of UFO reports called the "Phoenix lights" is caused by a nighttime military exercise nearby.

March 31: In 1932, the death of socialite Eben Byer from radiation poisoning at age fifty-one galvanized public interest in shutting down those selling quack remedies made with radium.

April 19: In 1982, TV documentary *DPT: Vaccine Roulette* first airs, increasing a public panic over vaccine safety and leading to the creation of the National Vaccine Injury Compensation program.

Tim Farley is a research fellow with the James Randi Educational Foundation and created the website whatstheharm.net.

January/February 2012 Hidden Messages Puzzle Contest Winner: **Debra Spangler**
This issue's prize: A one-year subscription (or extension) to Skeptical Inquirer.

HIDDEN MESSAGES

by Dave Thomas

The following letters are a simple substitution cipher. If R stands for L, it will do so everywhere. Solution is by trial and error. Hint: Look for patterns in words; for example, the scrambled phrase "JRXJ JRQ" might represent "THAT THE."

PUZZLE

"EI EM IRG IGXMEKX DGIVGGX WJGBIEZEIO BXF MQGUIEWEMC IRBI RBM UJKFLWGF IRG MILXXEXT BXF LXGHUGWIGF YEXFEXTM KY MWEGXWG."—WBJN MBTBX

CLUE: Q = K

ANSWER KEY

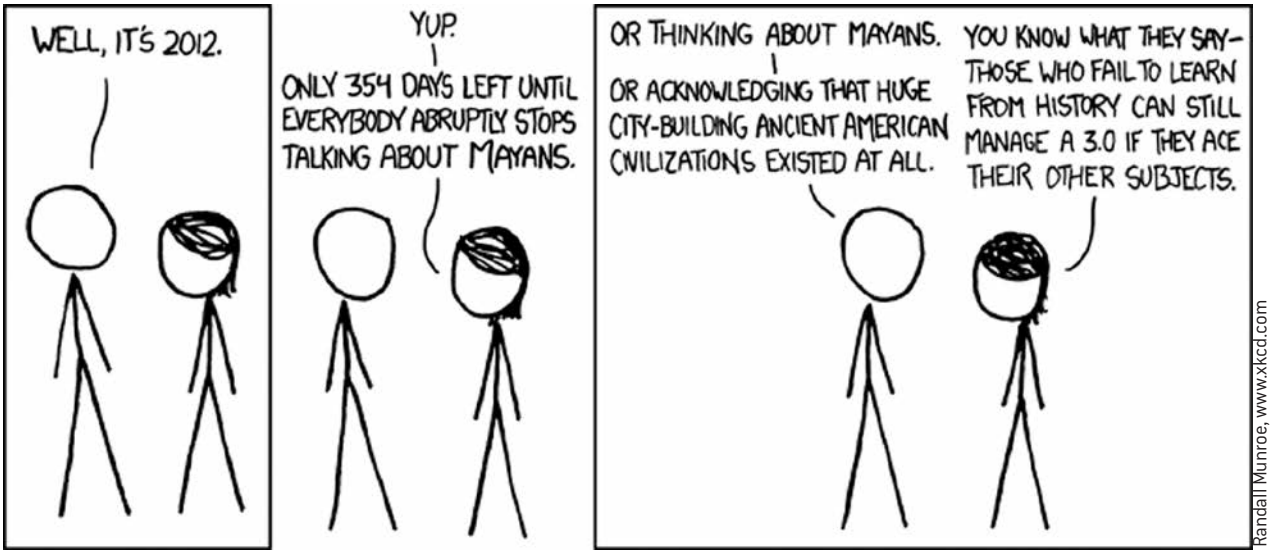
As you decipher letters, keep track of them with the handy answer key below. If you've decided that R stands for L, simply write down an "L" above or below the "R" in the alphabetized row below, just as you would for the cipher itself. This builds a handy, easy-to-use reference guide for you and will also reveal the "Super Secret Word," a puzzle within a puzzle!

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

PREVIOUS PUZZLE SOLUTION (January/February 2012):
"IT IS ERROR ONLY, AND NOT TRUTH, THAT SHRINKS FROM INQUIRY."
—THOMAS PAINE

SUPER-SECRET WORD: MISTAKENLY
(Instructions: www.nmsr.org/secretword.htm)

xkcd "2012"


WELL, IT'S 2012.
YUP.
ONLY 354 DAYS LEFT UNTIL EVERYBODY ABRUPTLY STOPS TALKING ABOUT MAYANS.
OR THINKING ABOUT MAYANS.
OR ACKNOWLEDGING THAT HUGE CITY-BUILDING ANCIENT AMERICAN CIVILIZATIONS EXISTED AT ALL.
YOU KNOW WHAT THEY SAY— THOSE WHO FAIL TO LEARN FROM HISTORY CAN STILL MANAGE A 3.0 IF THEY ACE THEIR OTHER SUBJECTS.

Randall Munroe, www.xkcd.com

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